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The CoEVOLUTION Quarterly

Winter 1977/78

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David Wil

In this issue. . .

A special 94-page section on broadcast as viewed at the end of the broadcast era:

Gene Youngblood calls for a radical change in the structure of the media.

Jerry Mander demands the elimination of television altogether.

Sol Yurick and Wes Thomas provide coverage of the Ultimate Launch.

William S. Burroughs reports from the shadow-zone between image and symbol.

Jacques Vallee probes the nature of disorder underlying messages of unknown provenance.

Bud Spurgeon portrays the broadcast vision of Nikola Tesla.

◆

Also:

Sylvia Crossman writes on ecological politics in France.

R. Crumb and Dan O'Neill draw four pages each.

Rodney Sirois, a Maine forest ranger, talks about a new kind of wolf.

Randy Black, a California firefighter, tells what it's like on the fire line and how you can join him there.

and Celebrations, a special 8-page section, presents photographs from the last volume edited by Minor White.

Cover *Tom Parker got the cover assignment by surprise, a week past cover deadline. The trick he pulled off was to portray television in a way that did not suggest the medium is evil in and of itself. In a sense, the cover art echoes (but does not illustrate) Gene Youngblood's call for a form of communication which permits utopias even if it doesn't create them. Between sessions at the easel for this cover, Tom supervised the pouring of a new cellar for his house and produced the dust-jacket for a book from a small press in his upstate New York neighborhood. God bless him.*

— Larry Lee

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"CoEVOLUTION," our founding idea, is a term coined by biologists Paul Ehrlich and Peter Raven (one each zoologist and botanist) to account for events that neither of their separate disciplines could explain. They noticed that plants they were studying carried large amounts of energy-expensive alkaloids that made sense only in terms of the voracious caterpillars who were put off by the poisonous quality of the alkaloids. Some bugs however (such as the Monarch butterfly caterpillar) adapted to the poisons (such as in milkweed) and kept them in their bodies to foil their own predators (such as bluejays). That's why nobody eats Monarch butterflies, and why they advertise their poisonousness with bright orange and black wings and slow flight, *and* why it is advantageous for other non-poisonous butterflies (such as the Viceroy) to mimic their appearance.

So much for the idea that evolution merely responds to inert processes such as climate. Indeed, a recent theory called the Gaia Hypothesis asserts that climate, and even the chemical makeup of the atmosphere, is highly co-evolved with all the Earth's organisms, including us.

Including us. That's the kicker, because the co-evolutionary idea of life ever more intricately fitting, fighting, cooperating with, and learning from other life only picks up speed and complexity when you mix in cultural species such as we.

The moral of the co-evolutionary perspective is its imperative to always look one level larger and one level finer (at least) than where you are, and to see clear through your cycles. So as you study your soil, your yard, your watershed, your bio-community and human community, your weather, your access to tools, and your night sky, be aware that they are studying you.

—SB

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Bill Netzer

But first, a word from our guest editors

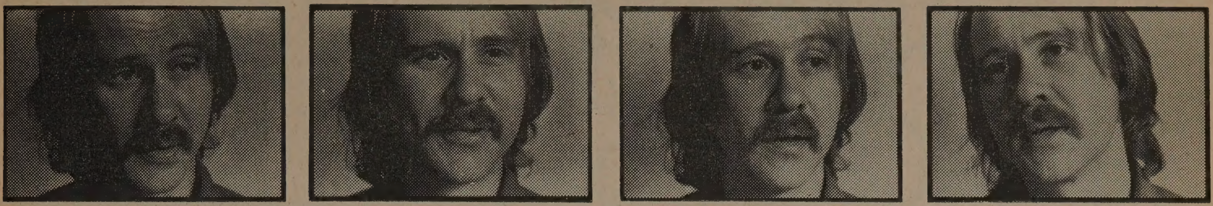
Larry Lee · Scoop Nisker

Broadcast, for our purposes, is the few speaking to the many. The few can be as few as Georgy Szigeti playing a Bach partita overheard, via transistor, by the lovers lying on a fern bank in some wrinkle of Mount Tamalpais. The few may be as populous as the shareholders of a big oil company, the production staff of a British commercial channel and the network resources of "public" television all collaborating to present some book by Trollope or Galsworthy as a "masterpiece."

These 96 pages on broadcast are a tapestry of broken dreams. Nikola Tesla's dream of broadcasting energy as well as information. Major Armstrong's dream of broadcasting pure sound indistinguishable from the original performance. The deferred dream of information flowing freely from creator to audience, among creators, among the audience — all unencumbered by common carriage tolls in perpetuity to the monopoly the government licensed to build the system in the name of *laissez-faire*.

Your guest editors have had some broken dreams of their own. We are performers on a San Francisco radio station whose staff invented the progressive-rock format ten years ago. We help supply the talk and the comedy that keep the songs from bumping into each other, and our roles tend to be as ambassadors (or hostages) from the world of print, whose forms are more accessible and concrete. In the past ten years, we have been involved in a variety of failed experiments to crack the dominant media forms of our day — listener-sponsored radio, free-form "freak" television variety shows, deadly-serious experimental television newscasts. All of them moribund or gone entirely. This personal experience of the dreadful inertia and stability of the popular electronic forms underlay our decision to turn down a great many proposed contributions which might have been expected in a **CoEvolution Quarterly** issue on broadcast. (There's a wind-powered FM station in Colorado whose range is limited by nature to a participatory audience. Video art which was art, indeed, but whose influence is more restricted than that of a good painting. Noble cable experiments which flunked our definition of broadcast simply because they are a matter of the few speaking to the few.) Instead we chose the whole-systems approach.

For our keynote article, we turned to Gene Youngblood, the author of **Expanded Cinema**, for the principal argument from **The Videosphere**,



Larry Lee (LL)

which will be published in 1978 or 1979 by Dutton. There's an old saw that vegetarians will blame the woes of the world on roast beef while podiatrists will assure you that flat feet and bunions underlie all war and strife. Thus, your editors are predisposed to agree with this fellow media worker who diagnoses media poisoning and a radical inversion of present-day communications systems as the antidote. But Gene's analysis, which relies in part on the thinking of the late Jacques Monod, represents, to us, a refreshing departure from the pawn-of-history feeling that McLuhan usually evokes.

The brief section on video toys and commercial exploitation of home video-and-computer services follows to provide a contrast with Gene's proposed National Information Utility. Novelist Sol Yurick (**The Bag, Fertig, An Island Death**) collaborates with technical writer Wes Thomas to place some of the recent quarrels over satellite utilization into their true mythic context. (Their piece is muckraking fantasy, and if you want to stop the Oligoposat, the real-life Public Interest Satellite Association will respond to your inquiry and/or contribution: P.I.S.A., 55 W. 44th St., New York, NY 10036.)

Robert Horvitz' conversation with the two men working on the complete rewrite of the Communications Act of 1934 portrays the job as divided amongst bureaucratic technicians and interested parties. The issues are enormously important, but you'll see little about them, certainly not on the tube, and you'll listen in vain for their mention during any sort of political debate. (Interestingly, Nixon created a White-House-level Office of Telecommunications Policy; Carter dismantled it. Is business-as-usual *laissez-faire* better than premeditated media dictatorship?)

Mary Jane Haley punctures America's chauvinistic illusion that world media are copies of American media, and then, in the special section's longest article, the former advertising man Jerry Mander sounds a warning against television in and of itself.

Bud Spurgeon's long piece on Tesla was the first article accepted for this issue, and Tesla's life defines the fate of those who set out with nothing more than good will and basic patents to make changes in the media matrix. What modern-day equivalents of Sarnoff, Westinghouse and Edison stand between us and the new media forms which would permit the diversity necessary for growth and change?

William S. Burroughs and Jacques Vallee write, briefly, on two aspects of the organization of information: symbol, the basis of a language we can understand only in terms of the shadows it casts across time, and the theoretical disorganization which may be the necessary ground for any information transfer whatsoever.

Finally, out for closing, just like good vaudeville, Marshall McLuhan himself, full of new ideas about the analysis of media artifacts, the changing role of work and a fresh left-brain/right-brain sorting system to replace his old hot-and-cool dichotomy. He is vindicated in his description of the global village, but immune to criticism that the loudest voices who live there are the garrulous networks who drown out everybody else. (Jerry Brown makes a telling aside that no one pursues, to the effect that one's taste *is* one's community.)

To your guest editors, who live in the San Francisco Bay Area, the tower portrayed here is an inescapable image of broadcast. Sold to us as a silver-sheathed equivalent of Seattle's Space Needle or the Eiffel Tower, the structure on Mt. Sutro is, instead, all spindles and struts and orange-and-white paint, just like the FCC ordered. It, not our bridges, not modest little Coit Tower, not even the silly but relatively charming pointy-headed Transamerica Pyramid, is the dominant artifact of the once-lovely San Francisco skyline. Now we learn that the tripod on Sutro is zapping hapless patients in a nearby teaching hospital and unwary high-rise Bank of America executives alike, with microwaves.

We are not knee-jerk Utopians. It is difficult to imagine a world in which consideration of the psychic and physiological fallout from the electronic media is a meaningful part of public debate, if only because those media have contributed so tellingly to the silencing of what debate there once was. It's time to turn off the television set and start talking about all this. We hope that this section provides tools for making a start.

* * * *

We'd like to thank all of our colleagues at **CoEvolution Quarterly** for helping us translate our contributors' ideas into print with a maximum of ingenuity and a minimum of headaches. It was kind of Stewart Brand to give two comedians a chance to pull a *Pagliacci* act on such a grand scale. How often does one get to edit one's favorite magazine? (It is doubtful that **The New Yorker**, our second favorite, is going to follow suit.) And thanks as well to our friends at KSAN-FM in San Francisco — to boss Jerry Graham for paying us while we worked somewhere else in utter silence and mystery and to Danice Bordett, Dave McQueen, Darryl Henriques, Larry Bensky and others for being on the air when we weren't and for proving that rock and roll will stand. ■

Scoop Nisker (SN)

The Mass Media and The Future of Desire

by Gene Youngblood

> "New organs of perception come into being as a result of necessity. Therefore, increase your necessity so that you may increase your perception."
>
> – *Jalaludin Rumi, 1273 A.D.*

This essay is about reality, the mass media, and human desire. In it I shall explore the effect of the mass media on individual identity, social history, and human evolution. My basic assumption will be that industrial civilization exists today in a state of evolutionary crisis which threatens our very survival, and that analysis of the mass media's role in human evolution can reveal what we must do to prevent the crisis from becoming a catastrophe.

When we ask what is the effect of the mass media on human evolution, we actually are asking an even more general question, namely, what has been the most important social consequence of the Industrial Revolution? This is because the mass media are the cultural arm of the industrial order that makes their operations both possible and necessary. The mass media are the technoeconomic foundations of what may be described as the culture industry or consciousness industry, a phenomenon which I regard as the ultimate expression of the industrial equation and as an imminent menace to individual identity, social history, and human evolution. I propose to show that the outstanding consequence of the Industrial Revolution is that, through the rise of the mass media, it has led us into an historical and evolutionary blind alley from which we may be unable to escape.

I propose to show not only that such a crisis exists but that it is caused by the mass media, and that only by totally reconstructing the mass media – that is, only by completely inverting their structural and functional organization – can we prevent the crisis from becoming catastrophe. I further propose to show that although the tool systems necessary for such an inversion now exist, they almost certainly won't be used for that purpose. This is because reconstruction of the mass media will require the participation of the media themselves, yet the primary purpose of their existence is to maintain themselves by maintaining the industrial order which makes their operations both possible and necessary in the first place.

I intend to demonstrate the validity of this basic premise by means of six propositions, each of which generates a separate discourse that embodies its own unique frame of reference.

The first proposition is that human evolution is cultural, not genetic. By this I mean that the biological evolution of the species is subordinated to cultural history insofar as culture orients behavior and behavior orients the pressure of natural selection. It follows that the significant environment in which we live and with which we interact for our survival as a genetic population is not the physical environment, or biosphere, but the symbolic environment, the culture, or what I shall call the videosphere.

The second proposition is that in any industrial society culture is generated and sustained by the four mass media – television, radio, newspapers, cinema. The mass media are therefore the arbiters of human evolution since they orient the culture that orients behavior that orients the pressure of natural selection. However, the intrinsic organization of the centralized mass media generates a fundamental corruption of culture through a process which I shall characterize as nonadaptive perceptual imperialism.

The third proposition is that we are experiencing what I will call a global ecosocial crisis. By this I mean all social problems understood as communication problems and as evidence of a condition of uncontrolled or runaway evolution – an evolutionary process generated by industrial society but not controlled by industrial society, and which therefore threatens the very survival of industrial society. The ecosocial crisis is worldwide, yet it can be treated as symptomatic of the structural organization of a single industrial nation like the United States.

The fourth proposition is that the ecosocial crisis of runaway evolution is caused by the mass media as arbiters of that evolutionary process, and can be resolved only through total inversion of the structural and functional organization of the mass media. By this I mean that the principle of mass audience communication itself as currently practiced in all industrial nations, regardless of content and regardless of the technoeconomic apparatus through which it's implemented, is the most destructive force in the world today, and must be abolished at any cost through an historically unprecedented communications revolution.

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The fifth proposition is that the potential now exists for just such a revolution which could result in the kinds of structural and functional inversions that will be necessary to resolve the ecosocial crisis. The purely technical aspect of this potential appears to be embodied in six tool systems which currently are developing as separate industries. They are:

1) cable communication networks, such as the cable television industry or the telephone system;

2) portable video recording equipment;

3) movie publishing systems such as video disc and video cassette devices;

4) home computers and information utilities,

5) domestic communication satellites; and

6) new information display devices for the home, such as large-screen TV displays and facsimile printout terminals.

Before discussing the sixth proposition I want to acknowledge that ideas such as these may well be regarded as utopian futurism, for the history of America is the history of futurism, and one almost never encounters a subject such as this in terms other than futuristic. But this isn't that kind of text, and anyone who regards it as such will have missed the point entirely. The spirit in which it was written and in which it will be most profitably read is a revolutionary spirit. I'm not predicting what will happen tomorrow. I'm specifying what must be made to happen today. My purpose is to sound an alert and to push for a mobilization. We must focus on alternative presents rather than alternative futures, for we invent the future by our actions today and we'll bury ourselves in the future if present actions continue.

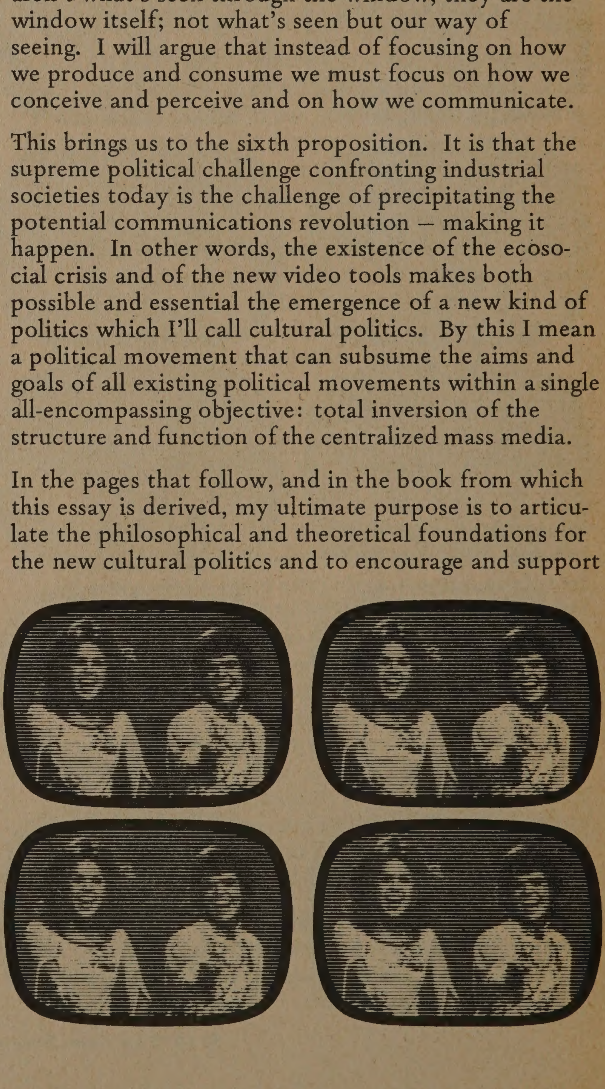
I write these words against a background of seemingly ungovernable crisis. It's the age of the apocalypse, for no one any longer can say whether humanity can survive. The world's leading scientists in the relevant fields seem agreed about this: we've created for ourselves a set of political and military crises, a set of technological and environmental crises, a set of sociocultural crises, which may prove impossible to contain. We've known what the Greeks did not: uncertainty. In the last two decades uncertainty has become endemic, for there's universal doubt whether the whole apparatus of industrial civilization actually works any longer. Repeatedly we attack dysfunctions in our social organization while the symptoms continue to worsen. The institutions we've built to secure our liberty and survival have grown into an industrial colossus which seems not so much protective as actually threatening. We're captives of gigantic systems beyond our control, systems which seem to produce exactly the reverse of desired results, actually contributing to the problems they're designed to correct. No longer do we lie down at night with a sense of security and get up in the morning confident that the great machinery of organized society is ready to carry us on. The spectacle is appalling. A marauding paranoia insinuates itself everywhere and we're convinced there's no remedy available, even to those who'd use it.

I submit that what causes the helpless feeling is the inadequacy of old forms of thought to cope with an historically unprecedented situation. We can't even think about finding solutions without correctly recognizing the problem, and it's now commonplace to pose our problems incorrectly. My purpose in this essay is to articulate the problem of individual liberty and social survival in such a way as to provoke politically effective questions — for the ecosocial crisis has reached its present magnitude primarily because the correct leading questions aren't being asked in public forum, in legislative bodies, in the educational programs of the schools.

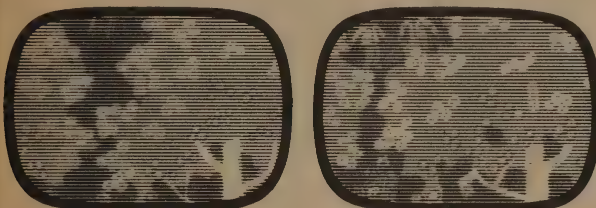
We look through a window, the window of the mass media, especially television, and we see all these problems. Problems so tediously redundant that it would be embarrassing to enumerate them here. Let me just characterize them — simplistically, it may seem at first — as problems which exist because of our inability to describe, hence to desire, a world without them. The point I wish to make, however, has to do not so much with those problems as with the frame through which they're observed. For we tend to dissociate the problems from the frame. We tend to focus on what's seen rather than on our way of seeing. I will argue in this essay that our problems aren't what's seen through the window, they are the window itself; not what's seen but our way of seeing. I will argue that instead of focusing on how we produce and consume we must focus on how we conceive and perceive and on how we communicate.

This brings us to the sixth proposition. It is that the supreme political challenge confronting industrial societies today is the challenge of precipitating the potential communications revolution — making it happen. In other words, the existence of the ecosocial crisis and of the new video tools makes both possible and essential the emergence of a new kind of politics which I'll call cultural politics. By this I mean a political movement that can subsume the aims and goals of all existing political movements within a single all-encompassing objective: total inversion of the structure and function of the centralized mass media.

In the pages that follow, and in the book from which this essay is derived, my ultimate purpose is to articulate the philosophical and theoretical foundations for the new cultural politics and to encourage and support



the rise of a new breed of political activist whom we may call cultural workers. Our task as cultural workers is to cultivate a climate of opinion calling for reconstruction of the mass media. To establish this issue in the mainstream of public debate as the supreme political issue of our time would be to pull a thread that could unravel the very fabric of industrial civilization. This is no academic expectation, no futurist's dream, but a political imperative if we're to make the world work. To do it, however, we must be capable of inspiring confidence in our peers and of effectively expressing politically correct demands for creation of the new social order. It is toward this end, and in this revolutionary spirit, that I offer the following considerations.



The Communications Revolution

Let us first consider the proposition that the new video tools are capable of precipitating an historically unprecedented revolution in the structure and function of the mass media. This potential becomes clear if we consider them not as independent entities but as components of a single, integrated, nationwide telecommunication system which would subsume, invert, supplement, and in some instances replace the functions now performed by the present mass media. I shall refer to this hypothetical system henceforth as the National Information Utility.

In applying the notion of a communications revolution to this set of tools I mean to suggest that it's theoretically possible to integrate and organize them in such a manner that the new structure would amount to inversion of the "industrial organizing principle" that is the source of the structural and functional identity of our society in general and of its mass communication subsystems in particular. Simply defined, the industrial organizing principle is the principle of centralized mass production and mass distribution. It is manifest in, and implemented through, the structure and function of any technocultural system which serves that purpose, and that includes almost all tools and institutions in an industrial society.

The mass communication subsystems of society are, like all other social subsystems, a special case of the industrial organizing principle: implemented through their structure and function it becomes the principle of centralized, one-way, mass-audience, nonadaptive distribution of messages. Accordingly, the chief functional characteristic of the mass media is that of processing centralized output — the centralized mass production and one-way mass distribution of symbolic messages to a captive mass audience.

If we define "revolution" as a radical inversion of the identity of a system we must conclude that there never has been a revolution in the structure and function of mass communication systems. Although many developments in the history of the mass media have been characterized as revolutionary, the differences have, in fact, been of degree rather than kind. There have been changes in the way messages are encoded for mass distribution (print, movies, radio, television) and there have been changes in the numbers of persons simultaneously addressed by these messages (always larger captive audiences); but throughout all these "revolutions" there's been no change in the industrial organizing principle of centralized, one-way, mass audience, nonadaptive distribution of messages, which has been the nature of all mass communication systems since the invention of moveable type.

Only today, and only through electronic information processing and telecommunications systems, is a truly radical revolution possible for the first time. This is because the communications revolution is only one possible outcome of an even more general and profound revolution in the science of electronics — a revolution that has been gaining momentum for more than 25 years. It has become increasingly apparent that the Electronics Revolution could be as far-reaching in its impact on our lives as the Industrial Revolution was in its effect on the society of the 19th century. It may well have greater impact on human history and thought than did the Renaissance. Indeed, it could have more profound influence upon evolving humanity than any other event in history, including the invention of the wheel, the harnessing of electricity or the introduction of print and telephony. Its ultimate effect could be — *must* be, I'll argue — to move us out of the Industrial Age into the Cybernetic Age, radically transforming the identity of modern civilizations.

Needless to say, such a revolution would be far more profound than a mere shift in ownership or power; it would mean not only a retooling but a radical inversion of the values served by tools. And of all tools employed by men and women, those which facilitate communication are by far the most important. Inventions and refinements in communications technology reverberate across all the arts and sciences in which men and women are engaged. They constitute the major force which determines how human beings think and learn to think. The underlying structure of the public communication system determines the total political and cultural reality of the society it organizes, and any significant change in that structure portends profound social consequences.

The changes that have occurred in mass communication systems up to now have been changes of degree rather than kind; but the revolution that could theoretically be realized through proper integration and organization of the new video tools would represent a difference of both degree *and* kind, for it would implement a principle of organization exactly inverse of that which is today the source of the mass media's structural and functional identity. We may characterize this inverse principle as the cybernetic organizing principle.

[more →]

COMMUNICATIONS REVOLUTION

Industrial Organizing Principle	Cybernetic Organizing Principle
Centralized	Decentralized
One-Way	Two-Way
Mass Audience	Special Audience
Nonadaptive	User Controlled
Message Distribution	Feedback Communication

Implementing this inverse principle of organization would mean replacing the processing of centralized output with the processing of decentralized input as the chief functional characteristic of the mass media, that is, the primary purpose of their existence. This in turn would make possible public access to information specified by the user and public access to communications channels controlled by the user. The important words here are "specified by the user" and "controlled by the user." These criteria make the premise significantly different from traditional notions about "public access" which don't assume structural inversion of the institution being assessed. According to our definition, however, these criteria will have to be satisfied for any changes in the structure and function of the mass media to qualify as revolutionary; and that's why it's possible to say that a communications revolution is a cultural revolution or it's no revolution at all.

The National Information Utility

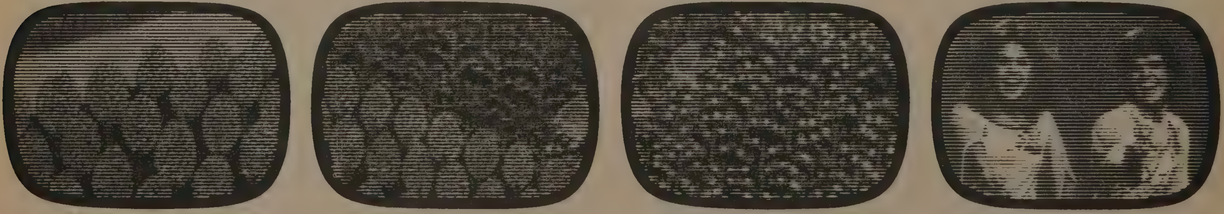
Paradoxically, the best example of a decentralized user-controlled feedback communication system happens to be the very heart of the industrial society: the switched telephone network. The telephone system is inherently input-oriented, that is, it's organized exclusively to process decentralized input rather than centralized output. What's so decentralized about it is the decision-power of the user. It's impossible for bureaucrats to define when or how we use the telephone. Although it is computer controlled, we decide when, where, how and for what purpose this multi-billion-dollar industrial colossus will be used, and its computers process our input on demand.

The telephone system is the most completely decentralized and fully user controlled public communication system ever invented, the only one in the world that allows the user to control the time, place and content of message production and distribution. However, three fundamental characteristics of the phone system render it unacceptable as the technological foundation for a National Information Utility. First, the telephone network is inherently a single-address rather than a multiple-address communication system (you can speak to only one person at a time) and therefore it's useless as a political tool because it can't be used to address the polis. Second, it's incapable of processing audiovisual images ("gestalten" and gestures of other persons), being designed exclusively for conceptual rather than existential dialogue; it is therefore inadequate as a tool for the cultivation and manipulation of alternative models of possible realities. Third, for most people (except institutional users of time-shared computer utilities) the telephone system has only throughput, no storage-and-retrieval capabilities; it has no "memory" and is therefore useless as a tool for inductive inference — we can't use it to learn from the collective past and to plan for the collective future.

However, if the basic principle of the switched network is modified to include both single- and multiple-address communications, audiovisual transmissions and publicly accessible data stores, we then would have the radical inversion of the existing mass media embodied in what I'm calling a National Information Utility. Such a system could integrate, synthesize, and transcend all the characteristics of both the switched telephone network and the mass distribution media. It could incorporate the program-distribution, news publishing, library, telephone and postal services of the nation together with teaching, automatic process control operations, and professional and social services such as medical and legal aid, all in a single decentralized, user-controlled, special-audience, perceptually adaptive, feedback communication system.

What would life be like with a National Information Utility? We can't really say for sure, just as we had no idea of what life would be like with print, radio, or television before those media were introduced. But we know the answer must be on two levels: operational, in terms of the operation of the overall system itself, and in terms of our interactions with it through our home communications terminal; and conceptual or attitudinal, in terms of the purposes (cultural, political, economic) which the total system is constructed to serve, as well as the motivations, expectations, and satisfactions we might bring to, and get from, our interactions with it.

Whereas the existing mass media constitute an advertising and marketing industry in which the mass audience is the product that's sold to the advertiser, the National Information Utility could be operated as a service industry providing public access to information specified by the user and public access to communications channels controlled by the user. I



submit that this will not be possible unless the National Information Utility is operated as just that — a common-carrier public utility supported by public funds; a legal monopoly whose services, deemed essential for individual liberty and social survival, would by force of law be made available to everyone at standard rates, with ownership of the physical plant separated by law from the power to program it.

The National Information Utility, in other words, would amount to a "demand information system" in which the user requests, receives, and pays for information, information processing, and access to programs and to communications channels that he or she requires at times, places and speeds that he or she specifies. Such a demand information system is possible only through the merging of the computation industry with the telecommunications industry, which already is under way, the resulting new services being made available to the public by a simultaneous switchover from a broadcast to a cabled video distribution system, which also is under way — although it's as yet uncertain whether the Wired Nation will carry an "Able Cable" logo or a big blue Bell. The important point is that, in an ironic reversal of what we've come to think of as technological progress, the historical development of public communications will owe more to Morse than to Marconi — for the distribution of information in America is about to come full circle from wire to wireless and now back to wire again.

Rather, it had better be by wire, for structural and functional inversion of the mass media won't be possible without it.

Since the new structure will be operated as a common-carrier public utility or not at all, the hundreds of transmission channels made possible by optical fibers and domestic satellites would necessarily all be operated as public access channels, rendering that concept meaningless since there would be no channel that wasn't publicly accessible. The very multiplicity would require that each channel be dedicated to a specific subject or class of subjects, supported financially by a combination of federal subsidy (without government content control), public subscription, and maybe even a little advertising (assuming it could compete with the computerized "consumer report" product information channels). Everyone, from autonomous individuals to primary groups to professional news and film producers would be able to produce programming for these channels so long as they addressed the subject to which a particular channel was dedicated.

It's almost certain that we would interact with the system through a single multimedia home terminal regardless of the medium of the interaction (audio, video, print) or its purposes (entertainment, education, research, data retrieval, voting, videophone). This terminal would be our input-output device for a virtually unlimited variety of communications channels and services, some required by law, others the result of entrepreneurial initiative. As a result, using the system would require more active participation and selectivity than do the present mass media, for which we are merely passive consumers of industrial output. Interacting with the new structure would be more like using the telephone or a library or going to a record store or bookshop. In other words, whereas today we ask "What's on TV?" with the new structure we'd ask, "What shall I put on my TV screen?" And our "smart terminal" would assist us in our search for the data, services, or programs we wanted — which would consist of a far greater variety, far more easily obtained, than is imaginable today.

So much for glamor hardware. What's important about this familiar scenario is that it's no longer science fiction. The technology is available now, like a self-fulfilling prophecy, and it makes feasible certain demands of industry and government which simply could not have been realistically asserted before the present moment. Meanwhile it's important to consider the purposes, motivations and attitudes behind our scenario — for it's certain that the circumstances I've described never will be realized without a significant change in media consciousness. And we can best understand the motivations implied by the new structure by first articulating the purposes of the present one.

The ultimate purpose of the mass media is to secure the maintenance of the industrial order that makes their operations both possible and necessary in the first place. They do this by celebrating conventional morality, validating the common consciousness, and reinforcing through redundancy the conceptual foundations of the culture. Their focus is "the truth as it is." On the other hand, the National Information Utility could focus on "the truth as it could be." Its purpose would not be to reinforce what is, but to cultivate the possible. The plurality of purpose and decentralization of control inherent in its very structure would mean that the National Information Utility could only provide the raw materials with which autonomous individuals and primary groups would construct their own information environments and synthesize their own realities.

As a result, our approach to the National Information Utility as users would have to be motivated by need rather than enforced habit — the need to hold before ourselves, continuously and pervasively, models of the kind of world in which we prefer to live, both material and cultural, the better to achieve such a world in reality. Indeed, it may be that only through the possibility of interacting with such a system can we ever come to realize what kind of world we do in fact prefer. And there lies the essence of the modern dilemma, for it seems that attitudes and values can change only *after* we free ourselves from nonadaptive perceptual imperialism and start creating and inhabiting another history. In other words, only in a society in which the mass media have already been functionally inverted will it be possible to invent and institutionalize forms of life that would be both personally liberating and compatible with the demands of the biosphere. This dilemma (Greek for "two premises") characterizes the historical and evolutionary impasse at which we stand, and the remainder of this essay is dedicated to elucidating the technoeconomic mechanisms which have resulted in it.

The Mass Media As Reality Synthesizers

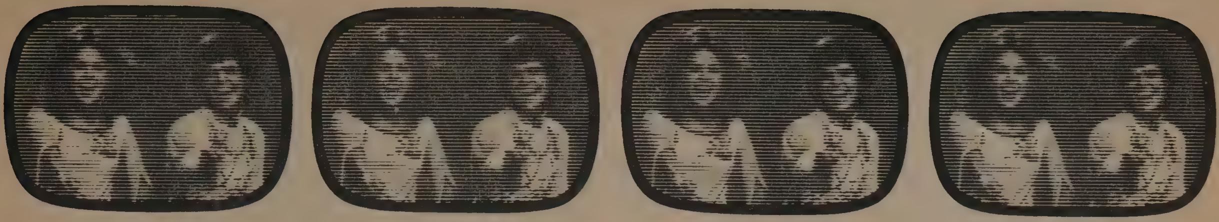
I have characterized the mass media as the foundations of the culture and/or consciousness industry and I have observed that their function is to generate cultural conditions compatible with the purposes of the industrial order that makes those conditions both possible and necessary in the first place. To do this it isn't necessary that the mass media cultivate popular desire for the industrial way of life. It is necessary only that they *prevent* popular desire for any *other* way of life. The media don't have to endorse "the system" in any overt way or say anything particularly nice about it at all. Conversely, we don't have to like or believe anything the media may say — so long as we don't have access continuously and pervasively to models which describe *in detail* a completely different kind of life. The only thing that's not permitted is the possibility of negating this social system by describing another one so completely that we could vividly imagine what life would be like in it, hence to desire it and then, perhaps, to demand it. The industrial order endures not by conspiracy but simply by default, simply because there's no popular demand for a specifically-defined alternative. And there's no possibility of such a demand because the mass media, due to their intrinsic organization, must necessarily deprive us of continuous and pervasive access to alternative models of possible realities.

Sociological investigations are conducted periodically to determine whether the media, especially television, have appreciable impact on human behavior. The question has always seemed absurd to me, for that, after all, is their purpose. When we say "media" what we really mean is "culture." And that culture is the single most important factor in the orientation of human behavior — especially that primary behavior called consciousness — is beyond dispute. Any anthropologist will agree that reality is a function of the culture in which one lives; this is true on the physiological level as well as the psychological plane. And in any advanced industrial nation, in any politically relevant sense, the mass media *are* the culture. That is, the product of their functioning is the common cultural reality.

It is important to realize that the character of this common reality is determined neither by the sender nor by the receiver of messages. It's predetermined by the industrial organizing principle itself, which requires that the messages of the media be read by millions of persons and, accordingly, that they be of a class which millions of persons will be *able* to read, that is, to which they most easily can relate as being possible realities. The messages of the mass media reflect the lowest cultural common-denominator of ideas compatible with the purposes of the industrial system which makes those messages both possible and necessary in the first place.

A culture is defined by the possible frames of reference which specify the classes of choices that are available for thought and action within it. The frame of reference defined by the lowest cultural common-denominator becomes "reality" for most people most of the time. It defines its own synthetic world of descriptions, and what is not described does not exist in any politically relevant sense. That's because these descriptions become the content of the four categories of consciousness which together constitute our entire cognitive reality, that is, the total significance any experience can have for an observer. These are the categories of existence, priorities, values, and relations. By this I mean that the centralized mass culture specifies for most people most of the time, in any politically relevant sense, what's real and what's not (existence), what's important and what's not (priorities), what's good and bad, right and wrong (values), and what's related to what else and how (relations). In this way the mass media synthesize the reality — the centralized mass culture — in which and to which our collective behavior is the only possible response.

There's an important lesson to be learned from the success of video evangelists like Billy Graham, Oral Roberts, Kathryn Kuhlman — that television is an evangelical medium whose gospel is the culture and whose crusade is human evolution. The culture is a carrot on a string. Natural selection is the decision to follow. Evolution is what happens when we do. As music is what awakens in us when we are reminded by the instruments, so thought is what awakens in us when we're reminded by the videosphere. We move through the incorporeal geography of the videosphere taking cultural dictation like Cocteau's Orpheus monitoring an immortal frequency on his car radio. The messages we receive orient our behavior and our behavior, reorganizing the environment down to the subatomic level, orients the vectors of human evolution.



Nonadaptive Perceptual Imperialism

The intrinsic organization of the mass media means that those meanings, values, models of behavior and descriptions of reality to which most people can most easily relate, and which are compatible with the maintenance of the industrial order that makes them both possible and necessary in the first place, will come to dominate the centralized mass culture and will therefore exclude, in any politically relevant sense, all other possible meanings, values and models of behavior that could have been published. The set of alternatives becomes drastically reduced, and with it the liberty of the imagination, for our imagination of the possible and the feasible is determined by the set of alternatives held before us.

Against the advice of my mentors and colleagues, I use the admittedly inflammatory label "nonadaptive perceptual imperialism" to characterize this ability of the mass media to attenuate desire by attenuating the set of possible descriptions that constitutes the common cultural reality. My use of the notion of imperialism is not meant to carry the conspiratorial connotations usually associated with it in political discourse. Rather, I mean that a nonadaptive perceptual imperialism is inherent in the very techno-economic structure of all mass media, regardless of content and regardless of the ideological environment in which they operate. It cannot be abolished by hiring new managers. It can be abolished only by eliminating the machinery that makes it necessary and therefore the demands for output that give it authority. I mean that the corruption of language and of information, and the inability of information to modify consciousness, is a function of the way the information system itself is organized. It's the industrialization of the mind, for our imaginations are industrially constrained to conceive only what can be molded into an engineered system of social habits that fit the logic of large-scale production. To understand more fully how the mass media achieve these results it is necessary to understand something of Information Theory.

The basic premise of Information Theory is that information is whatever reduces uncertainty. This means that for there to be information there must first be uncertainty. A message is informative only if some uncertainty existed before receipt of the message and the measure of information is based on the amount of uncertainty that the message cleared up. If no uncertainty exists there can be no information. If the message is predictable with certainty, if the probability of that particular sequence of signals is one-hundred percent (we already know what it contains), then it provides no information. The need for communication arises because something unguessable must be imparted concerning our understanding or actions. The essential aspect of information is the unpredictable, the surprising, as opposed to the mere repetition of gesture, incantations, or prayers.

The act of communication, therefore, necessarily implies the existence of a set of alternatives. For there to be uncertainty there must first be an ensemble of alternatives from which to choose. Information is a measure of our freedom of choice when selecting a message, either as sender or receiver. As soon as the possibilities shrink to one, communication is blocked; the message is deprived of its capacity to convey information. We answer the phone because we're uncertain as to the message the bell announces, and we're uncertain because we know it's only one of an infinite set of possible messages. If no such ensemble of alternatives existed, if we heard exactly the same thing every time we picked up the receiver, we'd no longer answer the phone: there'd be no information to gain because there'd be no uncertainty to reduce. Thus greater freedom of choice, greater uncertainty, and greater information are mutually interdependent concepts.

Now if information is whatever reduces uncertainty, and if uncertainty implies the existence of a set of alternative possibilities, it follows that the information conveyed by a particular message isn't an intrinsic property of the message itself; rather, its content is a function of the set of alternative possibilities that the message comes from. Meaning is a contextual relation.

As an example, consider the case of two soldiers taken prisoner by two enemy countries, one by each; and their two wives each receive the brief message "I am well." It is known, however, that country A allows the prisoner a choice from the set "I am well," "I am slightly ill," "I am seriously ill," whereas country B allows only the message "I am well." Two messages exactly alike; yet one conveys more information than the other because it comes from a larger set of alternative possibilities. The set defines the meaning of the message. Content is a function of context. The idea of information, in other words, refers not so much to what we *do* say as to what we *could* say. It's a measure of our freedom of choice. It refers to the set as such, not to any particular message assembled from the set.

This, then, is what I mean by perceptual imperialism. It's a structural and statistical phenomenon rather than a semantic one. It refers not to what the media *do* say but to what they *can* say, as defined by their mass-audience frame of reference — that is, by their very structure. In terms of political strategy this means that as cultural workers we must turn our attention away from "this message," and focus instead on "people receiving messages." In other words, we must focus on the structural mechanisms that permit the mass media to attenuate desire by reducing to a narrow spectrum the models of behavior and descriptions of possible realities that are held before us.

The Faustian Future of Perceptual Imperialism

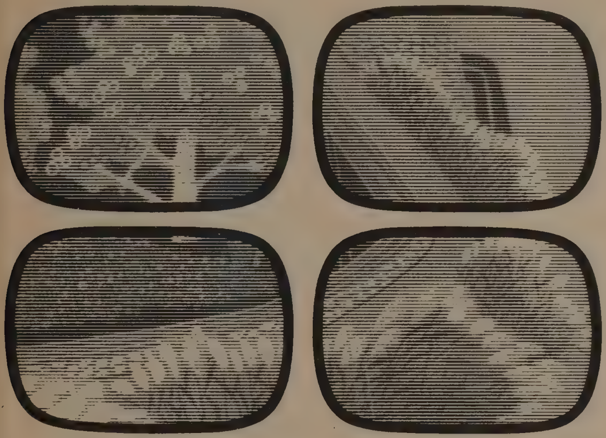
Consider the history of movies about humanity's relationship to technology and the future. All of these movies — from Fritz Lang's *Metropolis* to Chaplin's *Modern Times* to Godard's *Alphaville* to Kubrick's *2001* and *A Clockwork Orange* — promote the complex set of assumptions about human nature embodied in the expression "1984." This apocalyptic symbol, conjuring up like a conditioned reflex the image of an entirely probable, nonadaptive, dehumanized world, has been established almost universally as a model to which most people most easily can relate. It even has reached the point where movies of this genre are judged according to how effectively they portray the kind of world we all know will exist in the future. We know nothing of the sort, of course but that we *think* we do is serious enough, and it's exclusively a function of the nonadaptive perceptual imperialism inherent in a mass-audience distribution system that must necessarily reduce alternatives for thought and action.

The future world as portrayed in such films is characterized always by a stereotyped bleakness. The future never is better than the present, it always is worse. Implicit in them is the assumption that progress either is nonexistent or consists of an accelerating rush toward doomsday, thus reinforcing the assumption that we can't or shouldn't have control over our own history. In these Faustian futures the world is oppressively mechanized, maliciously computerized, ruthlessly and irrevocably totalitarian. The supreme despot is either man or machine or both. Men and women lead sexless dehumanized lives, physically preprogrammed, morally reflexed, functionally determined by awesome others. Love, pity, freedom and other humanistic values are viewed as "inefficient" and thus as crimes against a State often equated with Logic. These dismal phantasms invariably are animated by the presence of a rebel whose human emotions and humanistic values somehow have survived the technocratic purge. He's a hero because he's an atavist, because he resembles us today: he loves, he feels, he champions beauty and poetry and justice. The story achieves routine suspense in the conflict between the Man of Today and the World of Tomorrow. The conclusion is predictable (that is, noninformative); either the atavist-hero short-circuits the computer, slays its pernicious programmers, and escapes with the Dictator's beautiful daugher — or is himself either destroyed or "rehabilitated," joining the society of the walking dead. This general theme, with whatever variations one cares to suggest, characterizes the vast majority of mass-audience expressions dealing with the future and technology because it's the model to which most people most easily can relate as being "true" or "realistic." Significantly, in those rare cases in which the atavist-hero is victorious over the forces of evil, the new world made possible by his victory never is depicted — or at least not with anything like the loving detail with which we depict the murderous and malignant future.

The Contingency of Desire

The popularity of such myths seems proof of the media managers' assertion that they "give the audience what it wants." This is true. It is also one of the most insidious tautologies ever devised by self-deluding humans, because we can desire only what we're given. Desire is learned. Desire is cultivated. It's a habit formed through continuous repetition of a particular class of interactions. Desire is the most important of all industrial products, acquired by enforced habit through the absence of alternatives. So it's not only that we can desire only what we're given; what's equally significant is that we *cannot* desire what we're *not* given. We do, of course, make our own selections of materials with which we cultivate our personal meanings, values and preferences, and we seek to influence those available to, and chosen by, our children. But we cannot cultivate that which isn't available. We don't order a dish that isn't on the menu. We don't vote for a candidate who isn't on the ballot. We can be neither for nor against an issue that hasn't arisen. We rarely select what's scarcely available, seldom emphasized, infrequently presented. We participate only in what's easily and repeatedly available. We select what's there for selection, quite in spite of the fact that we may hold no genuine desire for, or belief in, any of it. And indeed this appears to be the case. It's called alienation, the universal characteristic of life in modern industrial societies.

We know how to be depressed. We know how to fail. The videosphere is populous with models of human failure, but where are its maps of success and of joy? How are we to avoid a Faustian future when the perceptual-imperialist mass media continually deprive us of models for alternative thought and action? How are we to live healthy lives when the videosphere pictures only pathology and corruption? How are we to reach freedom when the mass media cultivate in us the illusion of participation while guaranteeing passive reception and perceptual imprisonment? To conceptually step outside of one's social system and observe it is an experience that may change one's ethic and transform one into a revolutionary, that is, into one whose ethic is different from that implied by one's social system and who negates that system by validating a different one with his or her conduct. It's for this reason that totalitarian societies, through economic, religious, political and military coercion, deny their members the possibility of being observers of their own social system and, hence, of changing it towards a more desirable one. Totalitarianism is the negation of the human being as observer, that is, the negation of the individual as a social component who can step conceptually out of the system that he or she integrates and judge it ethically.



Thus, although perceptual imperialism implies no conspiracy as generally understood, it nevertheless amounts to a most insidious form of totalitarianism. Totalitarianism means radical invasion of the private domain by the public domain, and there's no domain more private than individual perception and conception. Yet this most personal of all domains is the very one most radically invaded by the public domain as embodied in the centralized mass media, with their awesome power to control collective thought and action quickly and pervasively. What could be a more radical example of totalitarianism than the power of the mass media to synthesize the only politically relevant reality, specifying for most people most of the time what's real and what's not, what's important and what's not, what's right and wrong, good and bad, and what's related to what and how? This, I submit, is the very essence of totalitarianism: the control of desire through the control of perception.

Today it's essential that we program innovation, schedule it on demand. But the problem is *desiring* to program it, which requires that we perceive the need and understand the possibility. We're in the critical dilemma of having necessities and capabilities that exceed our perception and hence our aspirations, our desires. This brings us back to Aristotle's notion of "final cause" and "efficient cause." In the Aristotelian sense the brain is the organ of final causes, the source of will and of purpose. If the final cause is the desire to have a lighted match the efficient cause is striking a match. If we can perceive of a desired future state (the match ignited) we know how to act in the present – strike.

The challenge of modern times is that of learning how to need another way of life. We must increase our necessity so that we can increase our perception so that we can mobilize our desire. But we can't cultivate (increase the necessity of) what's not available. We can't really desire that which we can't vividly imagine. So it isn't true that contemporary attitudes and values actually have changed. What's true is that we're searching desperately to change them. What prevents our frustration from shaping new institutions is the inability to perceive alternatives, resulting in the absence of desire, hence of demand, for those alternatives.

We know, for example, that the educational system is obsolete but the absence of alternative models prevents us from imagining either a de-schooled society or the nature of educational institutions in a society that had disestablished school. We know that our public communication systems are grossly inadequate but after generations of nonadaptive perceptual imperialism we can't conceive of a demand information system or how we'd use one if it did exist. Consequently there's no public demand for a National Information Utility. We may note the parallel to the case of the telephone when it was first demonstrated by Alexander Graham Bell at the Philadelphia Centennial Exposition in 1876: no one then saw any need for such a device. Indeed, Western Union found Bell's proposal to place his instrument in every home and business "fantastic," "ridiculous," and "utterly out of the question."

The Ecosocial Crisis and The Liberty Of The Imagination

As a result of nonadaptive perceptual imperialism we've managed to have the same pathological effect on our cultural history as we've had on our biological evolution, but with an important difference. For whereas the biological evolution of the human soma has become degenerative since we stopped adjusting our bodies to the environment and began adjusting the environment to our bodies, so the history of culture — that is, of consciousness — has become degenerative because we've stopped adapting the symbolic environment to the imagination; instead, we subordinate the imagination to the symbolic environment, the centralized mass culture. Hence our cultural history becomes fundamentally corrupted through the attenuation of possible descriptions. And "the world," conceived as this very set of descriptions, becomes ever less imaginable.

We cannot, we must not tolerate this insufferable outrage upon the liberty of the imagination, for the liberty of the imagination is the liberty of reality. The whole history of human evolution involves the endless development of new language, new conceptual tools, new ways of talking and thinking so that more and more aspects of the universe of experience can be brought into our cognitive domains, contemplated and thereby enriched, enabling life to be lived in ways not possible before. By subordinating the imagination to standardized and stereotyped language the mass media corrupt the evolution of culture, hence of the human race.

Language is not the standard against which thinking is to be measured; on the contrary, language is to be measured by a standard it rarely, if ever, achieves: the imagery of human doubt and human desire. The generations of men and women are powers of the mind. The evolution of humanity is the evolution of the mind and of the descriptions of experience generated by the mind, for we live in a domain of descriptions. The limits of our language are the limits of our world. A new meaning is equivalent to a new word. A new word is the beginning of a new language. A new language is the foundation of a new consciousness. A new consciousness is the genesis of a new world. A new world and therefore a new consciousness and therefore a new language are essential now for human survival.

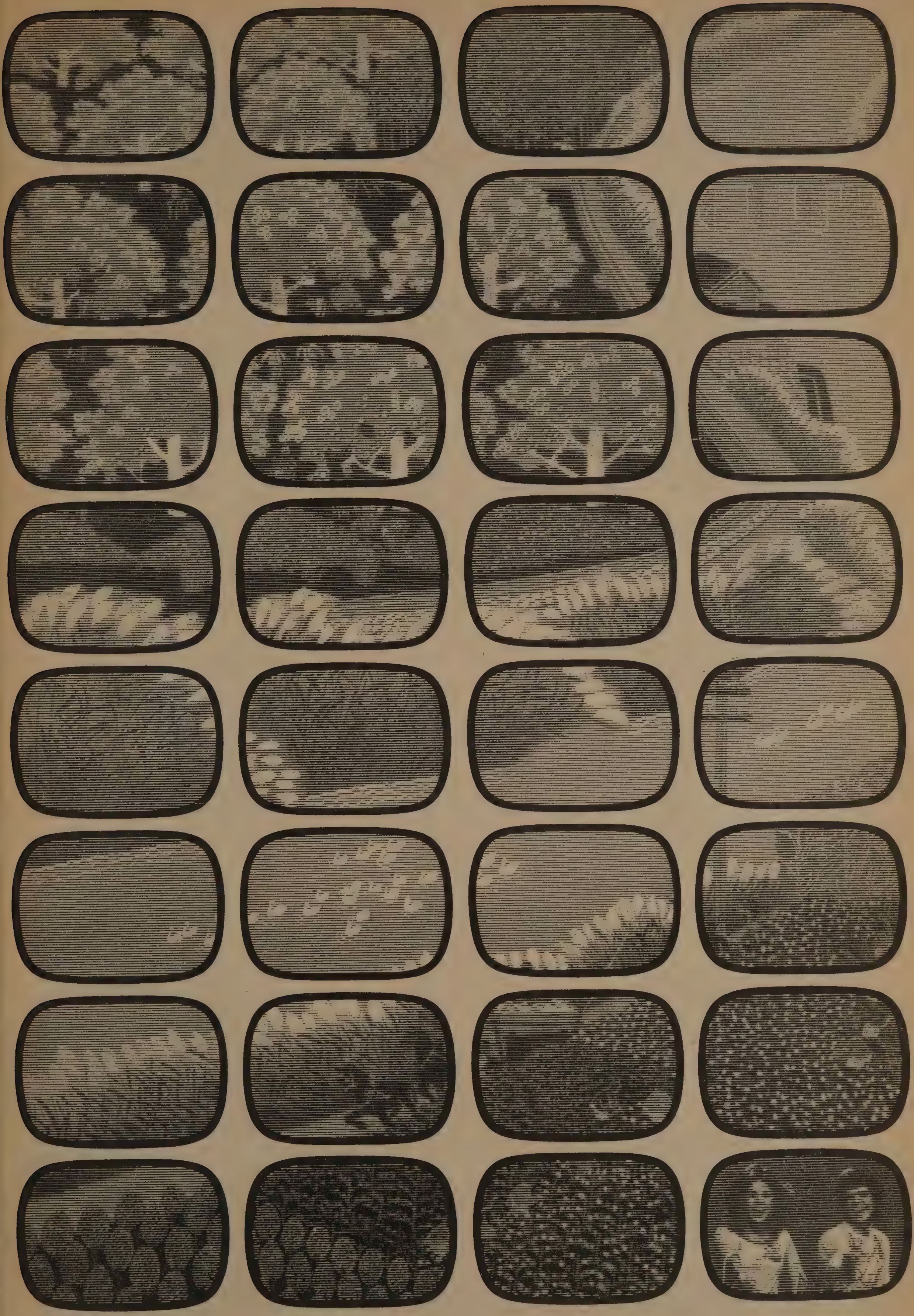
Self-Orientation Through New Media

The tools with which we can and must begin cultivating a new consciousness are now at hand. With these tools we could begin to construct languages that do not yet support any power but their own. We could contrive to emancipate individual thought from the common language sufficiently for a rehabilitation of both and, continuing from that, introduce an era for humanity where every thought has its language and where every human being has at their disposal a device that will respond to their input according to the language they stipulate, a language that specifies new meanings for the facts of experience.

For the mass media what's important is the illusion of "the truth as it is." For the individual observer what's important is the fact of "the truth as we see it." Our task is to establish conditions of decentralized user-controlled communication that will allow us to see the world as we actually do. As self-referring observers we are responsible for our own categories of perception, and by inverting the functional organization of the mass media we could assume this role explicitly. We could learn to perceive the content of the media not as reality itself but as models of possible realities: not as finished products to be consumed but as raw material to be manipulated until it reflects the perspective of the observer. Such an attitude toward, and manipulation of, the messages of the media would be a reminder of what we actually live in: a self-referring domain of descriptions in which we could generate a constant renewal of consciousness through orienting interactions with ourselves.

Such a use of television would amount to a new sort of political critique, no longer merely conceptual but imaginative, esthetic, through which we could, among other things, reconcile the claims of art and social conscience. For through such a tool we could surround ourselves with supreme fictions, recognized as fictions, through which we could propose to ourselves the fulfillment of our desire for a new and different reality. We could hold before ourselves, continuously and pervasively, models of the kind of world in which we prefer to live, both material and cultural; and by its response capability it could show us various alternatives for our role in such a world so that we'd be induced to desire it and, hence, to demand it. By increasing our perception we could increase the necessity of increasing our perception. We could educe from ourselves that for which we've been searching in ourselves and in the life around us, but which we've not yet quite found. We'd be able to cultivate (increase the necessity of) what's been in us all along but hasn't been consciously accessible due to the absence of an apparatus capable of cultivating it. We could at last begin living for the movie that is our own cultural carrot on a string, elevating ourselves by our own cognitive bootstraps to a new and different level of consciousness in which the total artifice would be revealed as the total reality. ■

From *The Videosphere* by Gene Youngblood. To be published in 1978 by E.P. Dutton & Co., Inc., New York.



How would you like to compose your own daily newspaper? Or select and order your supermarket produce without ever leaving home? While the following charts do not offer a complete vision of Gene Youngblood's National Information Utility, they do indicate the potential type and cost of various home information services now being considered.

The charts were prepared by Paul Baran of Cabledata Associates, Inc., of Palo Alto, California as part of a study conducted for the American Telephone and Telegraph Company. The chart information was compiled from a questionnaire-type survey of future systems experts and "company philosophers," who were asked about the nature, size, and composition of the likely market for broad-band two-way services to the home. The experts estimate that this industry will take off in 1980 and eventually build up to a dollar volume of $20 billion per year. They also predict that institutional lags will hold back development of the industry much longer than any technological considerations might otherwise require.

While reading the charts I had a paranoid flash of a world where no one would ever leave their house. All services would be provided, and isolation would be complete. *—SN*

Brief Descriptions of Potential Home Information Services

1. Cashless-Society Transactions. Recording of any financial transactions with a hard copy output to buyer and seller, a permanent record and updating of balance in computer memory.

2. Dedicated Newspaper. A set of pages with printed and graphic information, possibly including photographs, the organization of which has been predetermined by the user to suit his preferences.

3. Computer-Aided School Instruction. At the very minimum, the computer determines the day's assignment for each pupil and, at the end of the day, receives the day's progress report. At its most complex, such a service would use a real-time, interactive video color display with voice input and output and an appropriate program suited to each pupil's progress and temperament.

4. Shopping Transactions (Store Catalogs). Interactive programs, perhaps video-assisted, which describe or show goods at request of the buyer, advise him of the price, location, delivery time, etc.

5. Person-to-Person (Paid Work at Home). Switched video and facsimile service substituting for normal day's contacts of a middle class managerial personnel where daily contacts are of mostly routine nature. May also apply to contacts with the public of the receptionist, doctor, or his assistant.

6. Plays and Movies from a Video Library. Selection of all plays and movies. Color and good sound are required.

7. Computer Tutor. From a library of self-help programs available, a computer, in an interactive mode, will coach the pupil (typically adult) in the chosen subject.

8. Message Recording. Probably of currently available type, but may include video memory (a patient showing doctor the rash he has developed).

9. Secretarial Assistance. Written or dictated letters can be typed by a remotely situated secretary.

10. Household Mail and Messages. Letters and notes transmitted directly to or from the house by means of home facsimile machines.

11. Mass Mail and Direct Advertising Mail. Higher output, larger-sized pages, color output may be necessary to attract the attention of the recipient — otherwise similar to item 10, above.

12. Answering Services. Stored incoming messages or notes whom to call — possibly computer logic recognizing emergency situation and diverting the call.

13. Grocery Price List, Information, and Ordering. Grocery price list is used as an example of up-to-the-minute, updated information about perishable foodstuffs. Video color display may be needed to examine selected merchandise. Ordering follows.

14. Access to Company Files. Information in files is coded for security; regularly updated files are available with cross-references indicating the code where more detailed information is stored. Synthesis also may be available.

15. Fares and Ticket Reservation. as provided by travel agencies now but more comprehensive and faster. Cheapest rates, information regarding the differences between carriers with respect to service, menus, etc. may be available.

16. Past and Forthcoming Events. Events, dates of events, and their brief description, short previews of future theater plays; and recordings of past events.

17. Correspondence School. Taped or live high school, university, and vocational courses available on request with an option to either adult or graduate. Course on TV, paper support on facsimile.

18. Daily Calendar and Reminder About Appointments. Prerecorded special appointments and regularly occurring appointments stored as a programmed reminder.

19. Computer-Assisted Meetings. The computer participates as a partner in a meeting, answering questions of fact, deriving correlations, and extrapolating trends.

20. Newspaper, Electronic, General. Daily newspaper, possibly printed during the night, available in time for breakfast. Special editions following major news breaks.

21. Adult Evening Courses on TV. Noninteractive, broadcast mode, live courses on TV — wider choice of subjects than at present.

22. Banking Services. Money orders, transfers, advice.

23. Legal Information. Directory of lawyers, computerized legal counseling giving precedents, rulings in similar cases, describing jurisdiction of various courts and changes of successful suits in a particular area of litigation.

24. Special Sales Information. Any sales within the distance specified by the user and for items specified by him will be "flashed" onto the home display unit.

25. Consumers' Advisory Service. Equivalent of Consumer Reports, giving best buy, products rated "acceptable," etc.

26. Weather Bureau. Country-wide, regional forecasts or special forecasts (farmers, fishermen), hurricane and tornado warnings similar to current special forecast services.

27. Bus, train, and Air Scheduling. Centrally available information with one number to call.

28. Restaurants. Following a query for a type of restaurant (Japanese, for instance), reservations, menu, prices are shown. Displays of dishes, location of tables, may be included.

29. Library Access. After an interactive "browsing" with a "librarian computer" and a quotation for the cost of hard copy facsimile or a show-scan video transmission, a book or a magazine is transmitted to the home.

30. Index, All Services Served by the Home Terminal. Includes prices or charges of the above, or available communications services.

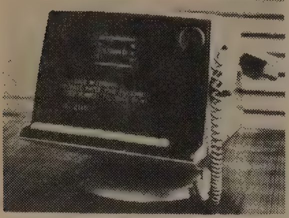
Summary of Median Forecasts

Service	Duration of Single Transaction (min.)	Avg. No. of Transactions/ Mo./ Home	% of Service Home Subscriber Expected to Pay	% of Penetration of all U.S. Households	Average Value of Service, $/Subscribing Household/Mo.	
					Median	High
1. Cashless society transactions	0.75	40	25%	20%	$ 6.4	$ 12.50
2. Dedicated newspaper	10.00	30	75	10	6.0	15.00
3. Computer-aided school instruction	30.00	20	50	10	40.0	100.00
4. Shopping transactions (store catalogs)	6.00	10	25	10	3.0	5.00
5. Person-to-person (paid work at home)	20.00	60	5	5	75.0	250.00
6. Plays and movies from video library	90.00	10	80	10	20.0	50.00
7. Computer tutor	30.00	10	80	5	20.0	50.00
8. Message recording	3.00	7	90	10	2.5	6.25
9. Secretarial assistance	10.00	10	100	5	10.0	25.00
10. Household mail and messages	2.00	25	75	10	5.0	12.00
11. Mass mail and direct advertising mail	3.00	25	0	10	4.0	15.00
12. Answering services	2.00	20	100	10	5.0	11.25
13. Grocery Price list, information, and ordering	5.00	15	50	10	5.0	7.50
14. Access to company files	5.00	10	1	2	15.0	50.00
15. Fares and ticket reservation	5.00	5	40	5	1.0	2.50
16. Past and forthcoming events	4.00	10	50	5	2.0	5.00
17. Correspondence school	40.00	10	75	5	20.0	50.00
18. Daily calendar and reminder of appointments	1.00	25	100	5	4.0	10.00
19. Computer-assisted meetings	30.00	5	40	5	15.0	91.00
20. Newspaper, electronic, general	10.00	30	75	5	15.0	22.50
21. Adult evening courses on television	50.00	10	80	10	10.0	25.00
22. Banking services	2.00	20	60	10	4.0	10.00
23. Legal information	10.00	5	100	3	6.0	25.00
24. Special sales information	4.00	10	80	5	5.0	10.00
25. Consumers' advisory service	5.00	10	100	5	7.5	10.00
26. Weather bureau	1.00	20	100	5	2.0	5.00
27. Bus, train, and air scheduling	1.25	5	80	5	0.5	1.00
28. Restaurants	3.00	5	60	5	1.0	2.50
29. Library access	10.00	5	100	5	5.0	10.00
30. Index, all services	3.00	10	50	5	3.0	5.00

Hello Future, Are You There?

Now we can communicate faster, farther, more efficiently, through better connections and new media mixes, 2 ways, 100 ways, always in touch. However, new technology does not necessarily a communications revolution make. Garbage is garbage whether bounced off a satellite or transmitted through the medium of tribal drums. On these two pages some of the latest communication wonders are displayed. What purposes they will serve remains to be seen. Many thanks to our friend Michael Liebhold for the research, gathering, and inspiration for this spread.

—SN

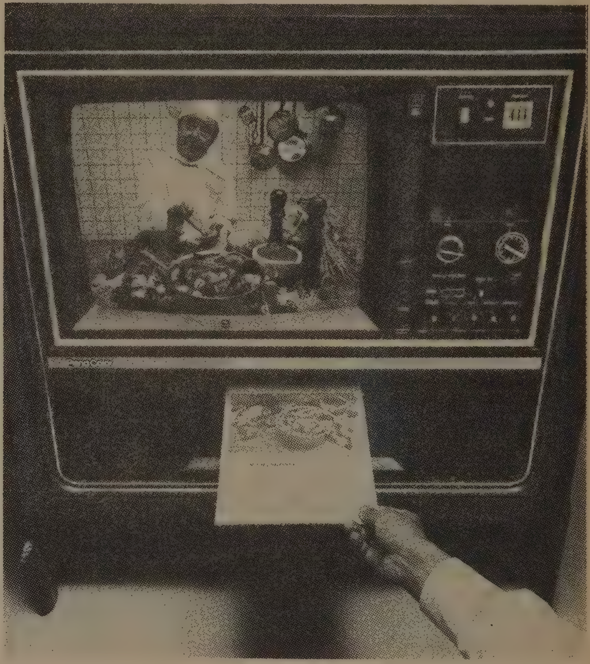


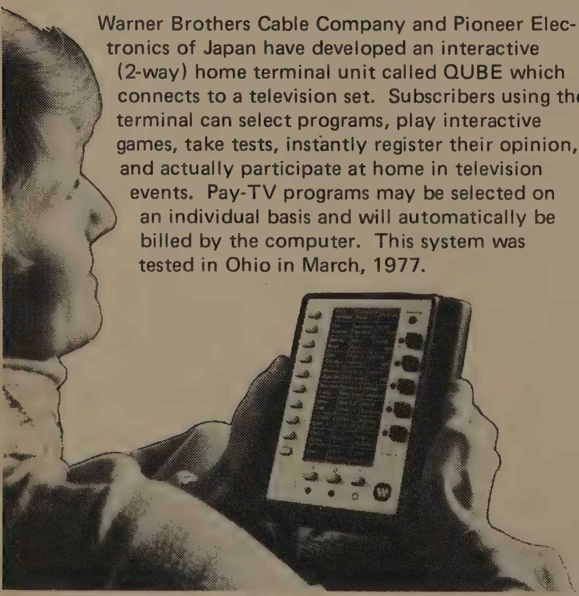
Viewdata is a home computer information retrieval service scheduled for test marketing in England in June, 1978. The service will operate through the existing telephone system and by the time of the test (700 households), there will be over 60,000 pages covering 300 different subject areas available from the data base. The viewdataphone receiver pictured here will also be able to display Teletext, a news service broadcast through the air by Britain's two TV networks, BBC and IBA. Mass Market installation in England is planned for the mid 1980s. Germany, France, New Zealand and some American interests, are now also considering Viewdata/Teletext service.

In addition to *VIEWDATA/TELETEXT* there are other indications that FAX news service will again be available in the U.S.

- Dow-Jones - *News Retrieval*. A "smart" typewriter attaches to any telephone and computer time share terminal (the kind corporations have). It will print out on command any news stories from the Dow Jones News Service moments after they are reported, current articles from the *Wall Street Journal*, and *Barron's Weekly*.
- *Xerox* and others have facsimile transmitter/receivers that can send hard copy anywhere in the world in as little as 60 seconds. Xerox has one that fits in a suitcase.
- Matsushita Electric has been test-promoting in the U.S. a new TV console/FAX printer combination, called the Television Multiplex Facsimile. Select a channel transmitting facsimile to receive almost any kind of information you desire, and in two minutes this TV machine will hand you a letter size page printed in full color on ordinary paper. For example, you can get a printed recipe from the cooking program you are watching on your screen.

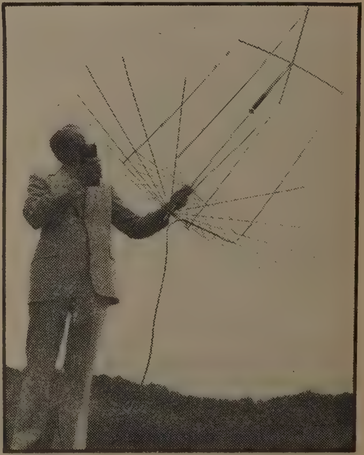
The promotional copy reads, "When will this dream system become a reality? When government and industry agree on new broadcasting systems and regulations. And when they do, Matsushita is ready, willing and, most definitely, able."





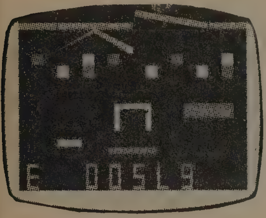
Warner Brothers Cable Company and Pioneer Electronics of Japan have developed an interactive (2-way) home terminal unit called QUBE which connects to a television set. Subscribers using the terminal can select programs, play interactive games, take tests, instantly register their opinion, and actually participate at home in television events. Pay-TV programs may be selected on an individual basis and will automatically be billed by the computer. This system was tested in Ohio in March, 1977.

Using an ordinary walkie-talkie and an antenna built upon the frame of a golfer's umbrella, G.E. engineer Roy E. Anderson transmitted a message from Washington D.C. through ATS-3 — a NASA satellite in geostationary orbit above the mouth of the Amazon river — to G.E.'s Radio-Optical Observatory near Schenectady, NY, a total distance greater than 50,000 miles. After receiving the message, Observatory personnel transmitted voice signals back through the satellite to Mr. Anderson. What was said remains a mystery.

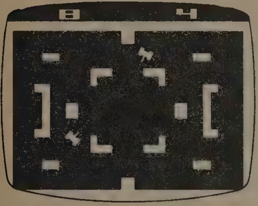


The Toys of Technology

So far, one of the best uses of your television screen is for video games. Atari is the master in this field and they have developed several new varieties of these games for fun and profit. Here are a few pictures and some rather bizarre advertising copy promoting Atari's new offerings. A note of caution: nobody knows the physiological effects that might result from having your nose close up to the TV scan in your efforts to become pong champion of the world.



"This game is so addictive, it's diabolical." "People kicked walls and screamed uncivilized noises when we consumer-tested these games and confirmed what we already knew. Video Pinball ate people up."



"It's a fun game. Of course, each game is only a battle. The war goes on forever." "The challenge is what's fun. That's why we pretested Tank II at every opportunity and kept improving it. If war wasn't hell, who'd play it?"

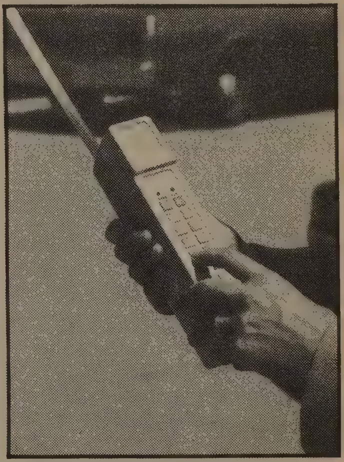
The first issue of *Satellite Communications*, "The International Magazine of Satellite News, Applications and Technology," was published in October, 1977, under the editorial direction of Dr. Delbert Smith, author of *Via Satellite*. The magazine primarily is devoted to the commercial applications of satellite technology, "a burgeoning industry." A partial list of upcoming article titles includes the following:

- Shopping List for the Prospective Satellite User
- Outlook for Mail Delivery Via Satellite
- Who Owns the Geostationary Orbital Arc?
- Satellite Business Systems, Inc.: Are They Too Strong?
- Person to Person Via Low-Cost Wrist Transceivers.
- Update: Teleconferencing for Business Purposes Via Satellite

The magazine is also full of advertisements like the one pictured here, for companies that build earth satellite terminals. Be the first on your block to own one. For comparative shopping write for the magazine, Satellite Communications, 1900 West Yale, Englewood, CO 80110. Subscription: $14.95 one year.

Three Gadgets

Believe it or not. This is the Fairchild Model MV-100 solid-state television camera. It measures 3½ by 1½ by 2¼ inches, weighs 6 ounces, and operates under a wide dynamic range of light levels. For further information write, Fairchild Camera and Instrument Corporation, Imaging Systems Division, 300 Robbins Lane, Syosset, New York 11791.



A pocket-size portable telephone! Now you can always stay in touch. "Operator? Information . . . give me Jesus on the line."

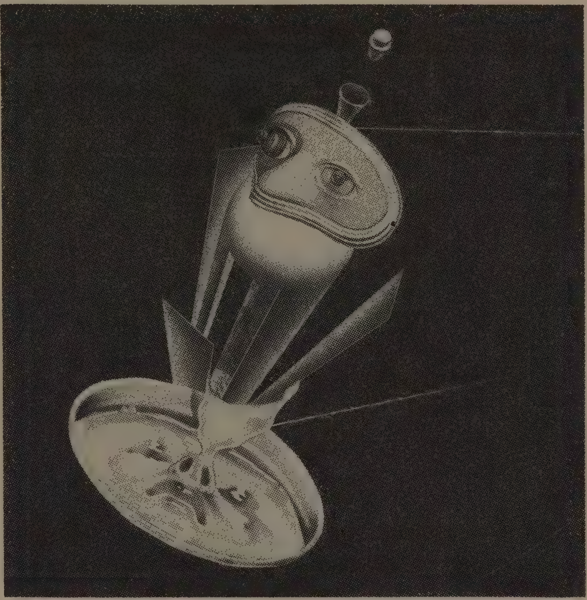
The Japanese plan to test this extremely small satellite receiver in 1978. Size: three feet in diameter. Cost: about fifteen hundred dollars.

Collages by Doug Wellman

THE EARTH GODS VS. THE SKY GODS:

Publisats Against the Oligoposat

BY SOL YURICK AND WES THOMAS



See it then as now. 1980-81. The shuttle's on the rocket and the SBS's in the shuttle, and they are on the launching pad. What is it it, this SBS? Satellite Business Systems, or is it the Socio-Beast-Synapsicon? God say; Flood's a coming, get up and out. Need an Ark and Ark needs an Ark-brain guidance system. Ark of Man, or what will be left of humanity after they have finished distilling, alchemizing any him-her into a communications essence. Convert a misfit in the cosmos into a MOSFET (micro-electric-semiconductor-field-effect-transistor) with its ying-yang, male-female, n &/or p-type material. This thing, it is the containership of every/any-one's collected spirit. Humanity changed into information and logic circuits; bodies, passions, souls, thoughts, events,genitalia . . . and or Josephson Multiplier Effects compatible with the deep cold of deep space. And here is the great ganglia in the sky, a nervous network not contaminated by flesh, earth, gravity, weather, not bothered by time, shit, pollutants, distance . . . This Ark, it contains, it *is* the genetics of all mankind, if you happen to think genetics is a message to the cosmos. Every second, 1/2 a billion bits flowing through.* It used to be that flesh was considered the container (albeit temporary, just a geocycle or so) of The Message; now it's a flesh-machine container . . . much more efficient too, error-correcting. A brain componented of the best of all brains.

(Some background material, groundrules . . . HE once needed us all to realize HIMSELF. (cf Dante, Goethe, Milton, Bunyan). Tiresome repetition of Greco-Judeo-Christian poetry newly disguised as information processing machinery. "I'll build a stairway to paradise, with a new step every day . . ." Has HE calvanized HIS Elect into electric energy? Escape earth, escape gravity, escape pollution, escape the devil, escape complexity, escape unpredictability, escape the demands of niggling communitarians, escape the desires of the old, the young, the black, the white, the brown, the Indians, the poor, the tribal, the ethnic, the localists, the nationalists, the religious, the earth gods . . . escape from people-hood. "Capitalism (is a) moving target," says Mobil Oil. "History is a nightmare I am trying to wake up from," says James Joyce, IBM, Estinghouse, Hughes, Wiener, Timothy Leary, Buddha, Jehovah, Von Neumann, Claude Shannon O'Neill, Eldridge Cleaver, Margaret Mead, Billy Graham, Arthur C. Clarke, Isaac Asimov and all the subcontractors from coast to coast.

"Whatsamatter? Can't cut the mustard? Can't manage the complexity?"

Nothing new in all this. Zeus too was once launched into geosynchronous orbit over the Christians, Mohammed over the Moslems . . . from where they proceeded to destroy all the diverse communitarian deities.

Zeusians are voyeuristic, eavesdroppers, always suspecting a plot against ITSELF, and so making sure it happens.

What is the nature and property of Sky Gods? Corporative vision. The corporation, or GOD, becomes so because it is a religio-legal fiction, having real status, a collecting-collective emanation.

So then, Zeusian sexuality is incorporative; all humanity fucks to realize HIS greater glory, an allfuck composed of cohered all fucks, with the collective itch transmitted from the central broadcasting communications system. And so HIS/ITS sex organs become humanity itself.

The totality of human genetics then, is the genetics of GOD . . . But this is also to say that GOD'S genetics is information itself; aren't we told that "In the Beginning was The Word . . . and The Word was made flesh?" Only these days, having come full cycle, it becomes "In the Beginning was the flesh . . . and the flesh was made Word." Look, check it out; consult

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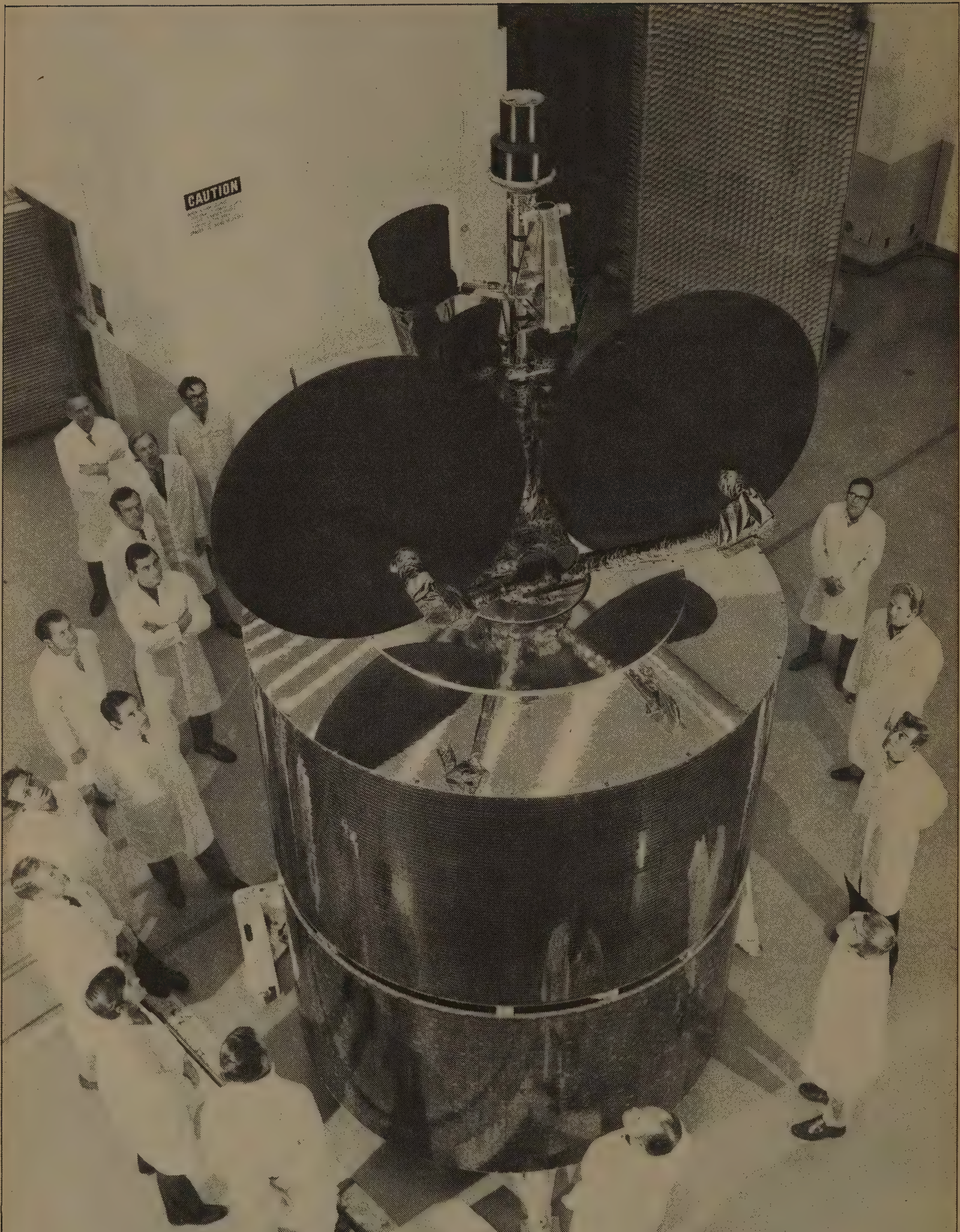
* 100 books every second or 140,000 conversations, the number of the Saved at Armageddon.



PRE-ASCENT CEREMONY: Sky God and worshipers

Courtesy of Hughes Aircraft

your old legends or, if you like it better, read up on your Wilson's Sociobiology. *All life is a hivelife. Recombination of discombined genetics is handled mighty like an anthology of information. But information is power and wealth, or, at least, symbols for power going from gold to paper to electronic impulses as an ultimate language of money, in which this money, this* credo-credit *is no longer* equated *with energy, but is energy itself, ultimate metaphor. All terms in this vast metaphor waiting to be connected up in one neurological system and one communicating system which receives commands and persuasions and feelings from the central processor. Perhaps through the Electronic Funds Transfer system?*

So your basic Zeus, he is a leveller, a converter of all language into one language, a quantifier of all languages, and a translator of all qualities into quantity. But, also, according to the laws of credit, interest, the increased and exponented velocity of all collected experience also acts as additional information . . . mighty like a financial bubble whose reality is drawn from the future . . . or, other systems. This requires the establishment of narrower and narrower – and so monopolized – expensive channels. All being funneled into an earth-escape velocity.

The first law of the Sky Gods is a modernized totemism; that is to say the conservation of matter, energy, information, money, and communications-channels, and, finally, biogenetics treated as information. The second law is a fear of energy-loss, information-loss, coherence-loss, complexity, too many channels available to too many people, too many languages, which will degenerate or entropize into chaos or Babel. Been there before. To overcome chaos, to achieve the concentration and ordering of matter, energy, information, money communications, or the bewildering array of too many life forms (or genetics), the SBS-like thing, or SocioBeastSynapsicon is required. (A nineteenth-century British journalist observed that "Heat is the Communist of the universe." How about that?)

Power is not only the accumulation, but also the ordering of the accumulation; the massing or concentration of quanta. As the massing becomes critical, one begins to approach infinity. As the speed of quanta approaches light, It moves toward an escape from time itself, and so lives in another space. But the only thing that can live in such a universe must be immortal. That's what it's all about. It is disorder that makes for the earthly drag on the Sky-God's ability to transform HIMSELF into an angel, and leads back to primeval chaos which is ungrammared, unalgorithmed, unprogrammed, unstructured, uncohered, unprocessed, all things flowing through multiple and uncontrolled channels. GOD forbid that conversations are not to the point and purposive. This leads to entropy and reverses evolution.

But there is a danger. The increased drive toward this angelic transformation severs symbols from their resonance with the rest of the world. A yawning gulf develops between the circulation of symbols and the circulation of material life, which is to say things like human life, shelter, clothing, and so forth.

All of this can be seen to be nothing more than your basic and compelling, your mythic evolutionary and teleological exponential curve which is called Progress, in which it is written that the direction is up from the primal slime to the lower animal orders, up to and through humanity and up to a flesh-machine interface, half-angel, half mere biology. And so that's how 'new' forms come into being, generated out of a compulsive commitment to an old and silly myth.

Now beware. This GOD is a trickster, a confidence man, a ventriloquist. In ancient times HIS priesthood claimed that God's voice came down from the heavens. What this meant in practice was that this God invented ingenious abstract-religious applications-systems that intervened and mediated between humanity and earth, humanity and sky, humanity and humanity, person and person, inventing bandwidths and channels that linked all things through the Temple's central processor, so that all communications would have to go through the one center. These days, following this ancient wisdom, HE bounces his voice up to the galaxies, and when HE gets back an answer (and nothing stops him from inventing one . . . controlling communications, threatening excommunication) HE says it is the voice of more distant and advanced civilizations, and proves it by statistical arrays to be not only possible, but even probable. HE also reinvents cosmology, Black Holes, White Holes, time-space warps, Big Bangs, Steady States, as well as other mythologies of creation. Well, even if there's someone out there, let's consider what we have here . . .

Now this God is manyfaced and Protean. He assumes many bodies and many masks, and HIS essence is to be sought out in the labyrinthine bureaucratic corridors: NASA, Hughes, Boeing, Westinghouse, AT&T, OTP, Dept. of Commerce, FCC, HEW, and so forth . . . Daedalus couldn't have designed the maze any better. But, at the center, there still lurks that old primeval cannibal waiting, the Minotaur.

The Earth Gods, on the other hand, seem to be ecological; total-systems freaks. They are Promethean, information stealers, demanders of knowledge, channels, scarce frequencies, their own voice boxes. This too is an ancient tradition. But we must be careful; there are those who pose as earth gods. Behind their masks are also priests, politicians, bosses, senators, congressmen, hustlers, businessmen, translating from Sky to Earth, from Earth to Sky, wheeling and dealing.

Now what becomes important to remember is that making metaphors between languages and languages (information) and languages and reality, creates certain possibly disastrous consequences, and leads one to deal with fictions instead of reality. . . fictions that have real consequences in the real world. We can begin to understand that within certain limits, technology, scientific R&D, begins to determine what systems emerge, and that technology is also distinctly political. There are options as to which direction scientific development will take. The compatibility of software, hardware, jellyware (humans) leads to a sociopolitical communications system. But, also, within certain limits, technology

can be designed to try to fulfill an ancient myth. . . and will work, if it uses enough energy. As we scan the ancient legends, folktales and myths, we see information and communications archetypes, and see again and again, the fight over whether communications will be democratized or oligopolized. What this means here and now in this 1980-81, is that given a range of existing satellite technologies, a range of communications technologies, limited orbital slot over the Continental U.S.A., and one or two available bands, particularly 12-14 Ghz, the fight will be the same as has occurred again and again.))

Back to the Launching pad. The viewing stand is full. It's a weird setup, audience-wise. The stand really isn't there. Instead the audience has been brought together as holographic teleconferencing. The 'stand,' in fact, is all over the world. The Public Actors are viewing instead of acting on the Stage of History. With them is the everpresent bank of great moments out of which speechwriters, playwrights, publicity flacks with their handouts written in ancient times, precapturing the Moment, choose the ritual and everrepeated statements. Already publishers have bought up "The Dawn of The Space Age" memoirs.

The years have done funny things to theatrical proscenia. The audience of history have taken to being actors, or should we say the 'acted-on.' Whose lines do they read? Whose play do they act in? Acting for who-or-what audience? Broadcasted messages, constantly reiterated, move them.

Zoom in. Close shot. All we see is the ascent-vehicle. Great gantries, piping, tubing, smoking, visible and invisible umbilicals rooted all the way down to Gaia, the Original. (Image out of the 19th century again. Interest fertilizing the earth. Protestant divine's image.) Already it is a stock and tired shot. Once up in that old Empyrean, Zeus will once and for all bite loose the cords that bind him to earth.

What do you mean, crowded? Pan across the stands. Presidents, heads of state, generals, scientists (closeup of that grand old pioneer of ascents, Mr. Faust. "Care to say a few words, sir?" Out comes a burst of sound, images, metaphors, six billion bits. "Put it in your printer and it will give you the whole speech." Thank you. Now, moving right along . . .), foreign observers (eat your heart out), crowned heads of the world, courtesans, sociometricians studying the effect, public and secret agents, senators and congressmen, single-issue nuts, psychoanalysts, lobbyists, industrialists, poets and financiers, contractors and subcontractors. . .

The Johnny Mann Chorus of one million (An applications experiment; scattered around the country at different terminals; grant from the Cultural Foundations; mixed voices and headshots beamed up to the ATS-6 and down again. The message travels the long way around, perhaps a light year or more, through the Black Hole and out the White Hole of information-concentration, but obviously the most cost-effective) begins to sing. Electronic symphony. Quavery, wavery, nerve-jarring sounds. Overture is track from *Star Wars*. Words out of *Faust*. *Allegro Castratando*. *"New strength have angels at the sight, though none may scan the infinitude, And splendid, as in primal light, the high words of the world are viewed"* from a Landsat. *"As like the angel's host he grows, see how he breaks from bonds of earth . . ."*

But suddenly (out of where?) a voice breaks in; cacophonous, dissonant. *"What gulfs between him* *and those seraphim! Slave of the wheel of labor, what to him are Plato or the swing of the Pleiades?"*

"What's that? Where did it come from? Old tape not expurgated from the universal tape library? Phonefreaks? An ancient broadcast whose melody lingers on? A jealous AT&T? Cut to alternate channel. Mask it out."

But the voice continues: *"Am I the thing the Lord God made and gave to have dominion over land and sea; to trace the stars and search the heavens for power; to feel the passion of eternity?"*

"What's that flickering and forming on the screens? Quick, swing all cameras away? What? Still there? Track it down. Track it down."

An image begins to form. Swinging away from the hologramic illusion of stands filled with The Famous (look, there's Liz Taylor, and isn't that Farrah Fawcett, and Bert Reynolds sitting cheek by jowl not only with, wow, Harold Geneen, but even better, with Norman Mailer, Timothy Leary, Plato, Aristotle, and Kareem Abdul Jabbar. Oh, wow!) The screen, channeled into the privacy of your very own home, goes into their home, where anything can happen and usually does, is multisplit into thousands, tracked back to the points of origin. Famous actresses and great courtesans are seen, being felt and fucked; everyone half falling-down drunk and stoned; retching; vomiting over the terminal consoles. . . Has someone tapped in the OMniversal Surveillance system and loosed some dossiers that are better kept hidden? Bets are laid as to whether it goes up or stays put . . . or explodes. Las Vegas announces the point spread. Billions bet and everyone plays a home game, go or stop. Beyond, as in the background, mighty like an enormous chain of DNA, is seen men and women, men and men, women and women, linked into chains to be ultimately linked up by the SocioBeastSynapticon, plonking one another in any available orifice, maintaining a contact to the past and future as well. Quick activated flow chart, flowing and pulsing, assesses the cost of this immense fucking and the cost of the depletion from all other environments, a sort of living message-hormone chart showing how fertility draws the fertilizer out of the land. "And am-ber wa-ves of grain . . ." Comes the salesman: a little fertilizer? Oil based Godsperm to revitalize your dying-off lands? What's it all about? Why, it's only the Greek Gods and their raunchy murderous ways.

"What do I have to pay in order for these to fuck?"

Wrong question.

The individual sights and sounds pouring out through all the possible channels intermits between the countdown liturgy; gasps, grunts, shouts, screams, farts, belches. Some poor schnook phone-freak, following down all the pathways of electronicity, even connects to those being electrically tortured in the prisons of the world and his brain is fried. All becomes an electro-fuse which sounds mighty like a Music of The Spheres. Counterdrama; quickcuts *a la* a Coca Cola commercial, in slow motion, and we see the ecstatic and beautiful Young drift in a low gravity through the divine and hydroponic plantation set against a backdrop which is a projection of the best from all the sunsets ever seen.

What is this? Unwanted information being incontinently leaked? What deviant and mad compulsion is this loosed from which rogue information bank? Why wasn't this foreseen? A shot of vast coliseums all over the world, millions shouting in unison, "DE-FENSE, DE-FENSE . . ." Hot line to the Soviets, Chinese, PLO. "You double crossing us? We'll zap your satellites out of the sky."

"Hold it. Hold it. It's not us."

Allright then. Initiate Data base inquiry mode. All classifications. Activate troublemaker anti-profile. Recognition routine. Instant recall of all deviant geopositions. Electronic Funds Transfer tappers? Check all transactions. Track the moneyflow to all bionodes. See who failed to make a transaction, even for a second. Scan all genetic codes for deviation predispositions, correlated with FCC frequency scan. The EEC, Russians, Chinese, Japanese, Latin Americans, Interpol conduct a cooperative search. Exchange files. Go from possibilities to probabilities. A trillion dossiers in a nanosecond is the ideal. What's taking so long? If we only had this bird up there now this non-sense wouldn't take place. Need emergency legislation. Global emergency. Call a quick session of all the world's congresses, diets, parliaments, General Assemblies, Parties and Presidia. Electronic paging. Conducted entirely by electronic teleconferencing. Defense satellites thrown open. New appropriations are voted for ever new scanning systems operating in Real Time (electro-politics, you see). Speeches from the floor? No time, no need. Instead refer to the complete bank-compendium-anthology of all-purpose all time political speeches ever made, and compress into two or three speeches, including rebuttals. In the meantime contact whoever's making the trouble and let's bargain with them. The universal spectrum of all spectrums is being held hostage.

Wait, wait, slow the flow down. In spite of everything, a newly discovered and hidden history seems to intervene itself on everyone's screen. Who's doing it? What's happening? Suddenly there is a world blackout, but nevertheless the manifestations keep a coming. A picture appears. Ugly looking fucker; skin all puckered and scaled with disease, discolored into a thousand hues not intended for a human's skin at all. What's that? Where'd it come from? Bank throws up an archetype, that Old Earth God not invited to the Feast. Haunting spectre from the past. Pustules and sores, liver all tore to shreds, done by a skyhawk. Oozing from unnatural orifices. Words distorted into noise by whistles, gasps delivered from swollen lips and bleeding gums that hold only one or two teeth. Out of him comes a voice that begins to explain. *The emptiness of ages in its face, and on his back the burden of the world. Who made it dead to rapture and despair, a thing that grieves not and that never hopes, stolid and stunned, a brother to the ox . . .?*

Sportscaster steps forward and holds up a mike. "Yessir? What can I do for you?"

Whistlevoice begins to talk.

[more →]

"A word of advice sir. Could you make it short? Be conversational and brief. Intimate but inspired, if you know what I mean. These mikes are very sensitive. Don't bellow. We live in a time of sprint culture. Talk into the mike as if you were in your very own home . . ."

"I don't have a home . . ."

". . . and don't forget to look at the camera . . ."

In the meantime another figure is prepared to debate this weirdo. He holds a toy shuttle mounted on a toy rocket.

"Don't forget to hold up this little toy shuttle and point it every time you make a point. But be careful, it's jointed, comes apart easily. It's in stages, see. The stages symbolize the stages of history, evolution, see? At the end of the talk, throw the shuttle up . . '"

"Throw it up?"

"Throw it up. High . . ."

"What'll happen. . .?"

"Don't worry. The camera follows it up. The bay opens up and the SBS comes out and unfolds, just like one of those trick Chinese flowers you put in water, see?"

"I don't get it . . ."

"It represents the seamless whole. Experience of the whole. Holistic, get it? Every kid'll want one."

Steps forward and begins to talk alongside of the . . . whatever it is. Teleprompter begins to roll. Background is a speeded up history of the universe from the Big Bang on, the making of the suns and planets, the development of life, the growth of humanity coming up from the primeval slime, to the great step before the venture of launching the unassailable brain in space . . . The creature who steps forward stands there, holding the minibird, and as he talks, the scenes change with bewildering rapidity, as does his face, as the masks of the great are whipped on and off.

Conferences are called all over the country. The National debate is joined. The future of futurism, the future of telecommunications, great discussion of bandwidths, hertz, MegaHertz, gigaHertz, bits and gigabits. The Great Corporations enter the debate, people coming down from Ma Bell, IBM, CDC, and so forth . . .

All purpose scenario for all purpose conference in all purpose location (anywhere Hilton, Marriott, Ramada, and so forth) follows here: Two men move in with packed cartons, from which they take and assemble display, shuttle and rocket display, illuminated, as in a church, photographs of earth from space, space from earth, moving and illuminated flow chart of messages, so many that it pulses like flesh, miniature plants, speakers whiz on and off the podium, sometimes with slide shows, other times with inspirational movies, and inspirational music. Conference On Telecommunications Policy Research; Knowledge 2000 — Forum II; Rural Developments in Communications; Communication Futures Seminar Series; Satellite Communications For Public Service; Corporate Communications of The Future; Federation for Information Processing Congress 77; Personal Computing 77; Wescon 77; Eascon 77; American Society for Information Science (ASIS); Data Communication; Public Service Satellite Consortium; Intelcom World Telecommunication Expo . . . And, at the same time papers of all sorts are generated annunciating the future. Messages of tentative congratulations pour in from more advanced civilizations in more distant galaxies. . . . "I want to welcome you today . . . Today we have a very rich program, and, so, without further ado, and moving right along . . ." The words "applications, compatibility, in the near term, transponder, responder, desponder" are used again and again and again. "Cost-efficiency and cost-compatibility and distance insensitive. . ."

But there come forward now bands of communitarians demanding consciousness and interlinking and two-way interactive systems. Someone presents a program for a new and modern-adapted first amendment network, for medical, for education, for gossip, for information . . . Why, who is it? It's the Public Interest Satellite Association. They show the technology exists and talk both simply and at great length about the need to intercommunicate and show the technology and say that the band they need . . . why it lies in nothing else but what the SBS people want. Engineers come forth claiming that such technology lies far, far in the future, and that in time such systems will develop in an evolutionary way, perhaps when the Global Village is all wired up. The argument rages back and forth . . . The communitarians and the communications-hungry grow insistent. Ku-band, 12/14 GHz . . . give all humanity 500 Mhz. Enough for hundreds of thousands of simultaneous 'conversations . . .' Big antennae in space and cheap, cheap, cheap terminals on earth . . .

"The application of teleradiology via satellite to rural areas in the U.S. . . ."

"What about the cities? What's out in the rural areas other than the agribusinesses . . ."

" . . . result in a saving of $40-90 million per . . ."

"Where'd he get those figures . . .?"

"That's a ballpark figure . . ."

The American Medical Association shudders at the thought of all this cheap medical aid . . .

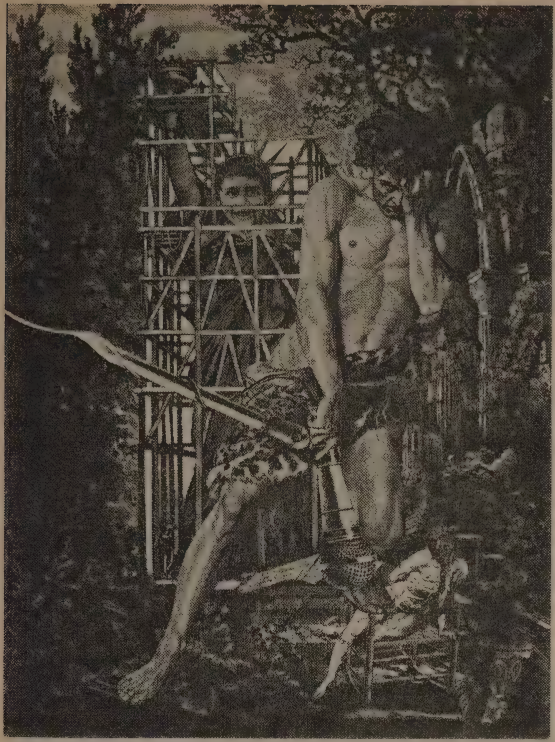
"Satellite-aided emergency medical service . . . applied to heart attack victims alone could save about 12,000 lives each year . . ."

"Please explain how you can prevent interference to small portable earth terminals from the powerful commercial and broadcasting satellites? Broadcasting has to go. Go. Go . . . A country of zombies . . ."

"Well where's your market? Who's your constituency?"

"We represent . . ."

"Go out and show us a market . . . aggregate your users . . ." (the root of the word 'aggregate' is Latin for sheep.)



The conference moves on. Educational satellite experiments are set up. New educational companies prepare packets for the future. Movies. Video. Tape. Film strip. All history is now reduced to digestible form by Disney Enterprises. Hitler is a bulldog, Tojo is a rat, and Columbus is a pussycat.

In the meantime, millions of frames of disruptive material are being flashed on your viewing screen. Endless pictures of the hungry, of the starving, of the communications-disenriched. The land is refertilized by a green revolution; the peasants are sent into the cities where they starve; crops proliferate, but using more energy than ever before; greatest conduit system ever invented. The debate rages on . . . and on . . . and on . . .

Until this quick report on history has brought us back to this near term of 1980-81, and the flames begin to spew out of the bottom of the rocket and the thing gathers its energy and begins now to rise . . . and we see that the whole thing, was all a charade, a ceremonial of ascent.

The Johnny Mann Chorus sings again:

> All things corruptible
> Are but a parable;
> Earth's insufficiency
> Here finds fulfillment;
> Here the ineffable
> Wins life . . . love . . .
> . . . Leads us above.

Love?

Can't wait. The signs are right. The Zodiac's come round to the right position. Born under the sign of Rockefeller, in the House of Chase Manhattan, in the mansions of IBM, cusped in the hands of All-state . . . all systems are go, and the Stages of Development ecumenically fused by the latest in technology and information investment begins to spew out roiling smoke.

BUT THE SHIP STANDS STILL: IT IS THE 'STANDS' THAT BEGIN TO RISE.

And now, unimpeded by the anti-evolutional, the information begins to flow faster and faster and, once and for all, all the world is definitively segmented between the Saved and the Damned.

(But since information, energy, genetics and money are equated, then a new sort of creature should be born up there . . . an angel, or at least an angel's mind. And isn't this what God promised us in Paradise Lost, *that new creatures would be created, new mutations, going through the long course of history, so that Lucifer and his minions who rebelled against God would be replaced? Earth, Frankenstein's test tube?)*

The financial transactions now proliferate to an unimaginable degree. Money no longer gets invested in *things*, but is circulated and circulated with interest and great but non-existent empires rise and fall in nanoseconds . . . Xanadu, Paradiso, Sci-fi realms . . . births and deaths . . . but only for an unimaginable fraction . . . faster and faster, consuming information is consuming energy.

Powerdrain; energy crisis; the big cities suffer brownouts and blackouts.

The lights are going out all over Europe. We shall not see them lit again in our time.

Hordes of organized junkies set the Bronx on Fire. Teams of creatures move in and take out the boilers and plumbing and they are melted down, reassembled, and put on as additional conduits in the system.

The lights in all the prisons dim; every prisoner knows that someone is frying.

The Triangle Shirtwaist Company goes up in flames.

The Library at Alexandria goes up in smoke. But never fear; its form is preserved on top of the Consolidated Edison Company in New York.

Watts, suffering a shortage of watts, ignites in order to see better.

Has Ahab caught and eaten, once and for all, the White Whale?

But no. Slowly at first, faster and faster, the earth begins to burn to a crisp . . . the planet earth, the space ship earth, and soon, only this satellite, this bird, will remain above, sending and receiving, processing messages, till it too soon begins to run out of fuel, and then begins its long plunge back into that incredible cinder . . .

> *. . . and so the Bird of Heaven, with archangelic shrieks, his imperial beak thrust upwards, (but) . . . his whole captive form folded in the flag of Ahab, went down with his ship, which, like Satan, would not sink till she had dragged a living part of heaven along with her . . .* ■

Getting into THE ACT

An interview with Harry M. Shooshan III and Andrew J. Margeson, Chief Counsel and Staff Economist, respectively, of the House Communications Subcommittee, taped on September 28, 1977.

by Robert Horvitz

In 1976, the House Communications Subcommittee decided to attempt to rewrite the Communications Act of 1934 – the law that created the FCC and spelled out the principles by which it still regulates all forms of interstate and foreign communication by wire or radiowave (except for systems owned by the federal government itself). This is, needless to say, a very ambitious and potentially controversial project. For while the '34 Act was never a great piece of legislation, any major change in the rules this late in the game threatens billions of dollars of investment and could significantly alter the quantity and quality of information-flow in many different types of systems. It is not an exaggeration to say that a new communications law could affect the structure of American society in general, and in ways that are not easy to foresee.

While commercial broadcasting is still the most visible of the services under the FCC's jurisdiction, and while some changes in that part of the law are surely desirable, new legislation is urgently needed to untangle growing confusion in the common carrier field and to facilitate the introduction of new kinds of communications services. Common carriers are companies, like Western Union and AT&T, that transmit messages from a particular sender to a particular receiver for a fixed, published price (in contrast to broadcasters, who cast messages over a wide area for free reception by anyone with the proper receiving equipment). The carriers are the foundation of our entire media system, and revolutionary changes in the underlying technology are forcing a drastic reorganization of the industry. The "natural" monopoly that the Bell System once had on long-distance telephone service is being challenged by satellite and overland microwave systems. Bell has already lost its monopoly on equipment connected to the phone system at the point of use, opening a potentially vast market for new voice and data-communication devices (you may have noticed in the Scientific American "Microprocessors" issue how many of the advertised products had built-in telephone cradles). On the other hand, Bell has been upgrading some of its lines and switching equipment so as to be able to handle the increasing traffic in digital and other kinds of non-voice data. In other words, the services that the telephone system now provides are not as narrowly defined as they were in the past, and many of them are essentially identical to services that can be obtained through other sources – – in sharp contrast to the way things were in 1934. The situation is increasingly chaotic as regulated monopolies, operating under one set of rules, and new equipment and service suppliers, operating under different rules, compete with one another in overlapping markets at the very fringes of the FCC's jurisdiction. No one seems to know what the consequences of all this might be, only that it is unprecedented, and too inequitable and too destabilizing to be tolerated much longer.

In a sense, this is just another illustration of the FCC's inability to cope with innovation. The air is literally filled with signals from now-healthy media that barely survived the FCC's phase-in plans – television broadcasting in the UHF band and FM radio, to name two. You'll notice, also, that we have no domestic communications satellite system yet, even though we've had the capacity, and the need, and have been offering international service through Comsat for over a decade. Bureaucratic inertia has a lot to do with it. So does pressure from the industry. But so does the '34 Act. If the FCC continues to be the bottle-neck it has been in the past, and if the present rate of innovation in electronics and related fields continues . . . well, something's gotta give.

So there are compelling reasons for seeking new legislation. The question is, what kind of legislation is the House Subcommittee going to come up with? To begin to find out, I went down to Washington for the Subcommittee's round-table discussions on common carrier issues (September 21-28, 1977), and, at the end of the final day, had a chance to talk with two people who have already had a great deal to do with orienting the Subcommittee's thinking and who will have key roles in drafting the new law. Chip Shooshan is 31, a graduate of Harvard and Georgetown Law. He has been Chief Counsel to the Subcommittee since 1974 and before that served on the staff of the late Rep. Torbert MacDonald, who was the previous Chairman of the Subcommittee. Andy Margeson, 27, (27!) is a graduate of Colgate and has an MA from the Woodrow Wilson School at Princeton. He has been with the Subcommittee since 1975, and, as staff economist, specializes in common carrier issues.

If you want to find out more about the rewrite project, send for a copy of the **Options Papers**, prepared by the staff of the House Communications Subcommittee, Committee Print 95-13, 95-Y4-IN8/4: P19/27, from the Government Printing Office (price unknown: probably about $6.00). Aside from broadcasting and common carriage, there are papers on spectrum allocation, public broadcasting, safety-special-and-mobile radio, international telecommunications, cable, the impact of communications technology on privacy, and regulatory structure and procedures, as well as a brief history of communications legislation in this country.

Two definitions to help you understand what follows:

Packet radio — a way of sending digital data by microwave. The signal is encoded so that as it enters the computer at the receiving end, it automatically triggers switches sending it to the right destination within the computer. This is mainly for use in large systems.

Cellular local radio — a system recently proposed by the Bell System as a format for radio telephone service on a national scale. Each person within a given region, or "cell," would be assigned a frequency that would be his or her channel to receive calls. A much more flexible system is now under development by non-Bell engineers called "spread-spectrum multiple access FM." The virtue of this second system is that it assigns to each person not just a frequency, but a coded combination of frequencies. Since there are many more combinations than there are single frequencies, each person could be assigned a number that would work anywhere. Under the Bell plan, if a person travelled to a different "cell" he or she would have to be assigned a temporary "visitor's" frequency. One member of the subcommittee's staff wrote in the spectrum allocation options paper that the Bell proposal may be accepted as the official national standard as early as 1979. In terms of service, this could be unfortunate, and the staff member questioned the economic viability of this less-flexible design. The August, 1977 issue of the **IIEE Transactions on Communications** was devoted entirely to spread spectrum FM.

CQ: Why did the Subcommittee decide to take on this task of rewriting the Communications Act of 1934?

Shooshan: Well, I guess there are two levels to approach it. On a practical level, in the course of hearings we had last year on domestic common carrier and cable television regulation, one of the allegations being made was that there was insufficient direction in the '34 Act to guide the [Federal Communications] Commission in making major decisions in key areas involving telecommunications. And so the feeling was, it sort of grew from within the Subcommittee — Mr. Frey, our ranking Republican, and then our Chairman, Mr. Van Deerlin — that maybe what was needed was a comprehensive re-evaluation of the Act, starting, at least theoretically, from ground zero and seeing what made sense and what was needed in terms of the future. In addition, in terms of philosophy, both Mr. Van Deerlin and Mr. Frey are basically de-regulators. They question the need for regulation in the first place, and, certainly, when you look at the Act at this point, it has given birth to excessive regulation. So the idea was, rather than picking off the regulations one by one, to question the basis and need for them. In a more general sense, you have three forces at work in any area of society: technology, economics, and policy. Communications is no different. And in the past decade, the technology in an area like communications has just developed so quickly. The advent of direct broadcast satellites was undreamed of at the time the Act was written; the development of cable, both pay cable and traditional cable; all of the possibilities that optical fibers hold for a greater variety of services. And then, in addition, miniaturization has made communications technology more generally affordable. The economics are catching up now, in the sense that industries are finding applications for this new technology. But the policy is still back in the 1930s — and, in the case of common carriers, the 1880s.

Margeson: The basic thing is that it seemed entirely appropriate to review the regulatory structure given a totally changed circumstance. At the time the '34 Act was written, we had two types of intercity electrical communications services. We had what's called telegraph or "record" service, and we had telephone, plain old voice service. Now, in the course of just these four days of hearings, for instance, we've had people who provide "packet-switched data" networks, which are the electronic equivalent to letters and mailboxes via computer. We had a company, Graphnet, that provides a "switched facsimile" service, which is a direct substitute for old fashioned mail. And I could go on from there. Things are just terribly, terribly different.

Shooshan: Nothing that we've done starts with the premise that we have a lousy communications system in this country, although some people have tried to read that into what we're doing. The question is, how do you take what's there and make sure it grows and provides choice in the future? And while one would like to think that the Act, like the Constitution, is a living document, it was never intended to be that, but rather a short-term solution to some very messy problems at that time. In looking at the common carrier area, just about all of those sections were put into the Act with the proviso that the Commission study and report back to the Congress on them. Some of those reports were made and nothing ever happened. Some were never even made. So it's a valid undertaking, although it is a massive job.

CQ: Could you describe the various steps the Subcommittee is following in developing this new legislation?

Shooshan: We started with the preparation of "options papers" by the staff, which were to lay out all the alternatives and get people to focus on the real issues. Then we go through these series of panel discussions, round-tables, before any legislation is drafted. We'll complete those within a couple of weeks. And then during the time between the sessions of Congress, we'll draft the legislation. That will go back through the formal hearing process, starting early next year, like in February, for example, with a particular piece of legislation for people to focus on. And then, although a lot of this is unforeseeable, Mr. Van Deerlin hopes — and expects — that we will have legislation through the Subcommittee and the Committee, ready for floor action, sometime in the next session of Congress. The closer we get to the drafting stage, the more realistic I think that goal is. A lot of people are doubting that it can be done, but I think that once something is on paper in draft form, the process is going to be speeded up substantially, just as once the options papers had been prepared, defining the universe of discussion for these policy sessions, the process has been speeded up.

CQ: I wanted to ask you a couple of questions relating to competition, because this is something that has cropped up over and over again, in the hearings, the options papers, and in the comments that the people in the panels have made. It seems that at least within the Subcommittee and the staff there is a strong conviction that increasing competition in the various communications fields will better serve social goals than extending or strengthening regulation.

Margeson: In general that's true, although if we're talking about the common carrier industry, I would enter some strong caveats to that.

Shooshan: And I would also in the broadcast industry.

CQ: That's exactly where my question was headed. Maybe if I finish what I was about to say I'll deflect your answers, but I just wanted to point out that, as near as I can tell, the historical evidence to support that belief is very ambiguous, at best, and in some ways supports a totally different conclusion. Why do you have so much faith in competition?

Margeson: Okay, let me take the first crack at that as it applies to common carrier competition. In the first place, with regard to the competition in the early days of telephony, that wasn't really competition because it was conducted mostly before patent courts, not in the marketplace. People talk about such-and-such as a "natural monopoly," the Bell System as a natural monopoly. That is always dependent upon a particular state of technology or group of technologies. We have a lot of alternative technologies now which did not exist back then. We didn't have microwave radio in 1934. We didn't have "packet" radio in 1934. We didn't have "cellular local" radio in 1934. So competition may work in some eras of an industry and not in others. That would be one strong caveat. The second strong caveat is: there are, as Bell alleges, significant dangers in mixing monopoly and competition. Now, I would not conclude from that that one should never do it, but one must be very careful in introducing competition into a previously monopoly or oligopoly market, making sure that one does not so hamstring the existing companies that we end up with a financially unviable major communications carrier. By that I mean not giving them the lattitude and flexibility to respond to competition with new service offerings as their technology permits; not allowing them to reduce prices where they can be justified by cost showings; imposing unfairly obligations on them that are not imposed on all. One must be very careful in the process of introducing competition, not holding one company down while you let the rest get at them.

CQ: Do you have anything to add about competition in broadcasting?

Shooshan: Well, the issues are slightly different there. I think that as you look at the regulation of broadcasting — this is my own opinion, I'm not speaking for Andy, and certainly not for the Chairman — the regulation of broadcasting has largely been a disaster. We expect that a group of a couple hundred bureaucrats at the FCC can effectively regulate 9,000 radio and television stations, and, as a result, we raise the expectations of the public and then shatter them. When you look at the figures, 99.9 percent of all licenses in the broadcast area get renewed. I mean it's a rubber-stamp process and yet there are tremendous paperwork burdens placed on the broadcaster to justify his "public trustee" status. So my feeling is that regulation has traditionally not worked that well in broadcasting and there ought to be a rather more limited role for it. The problem is not so much that people are not satisfied with broadcasting, but rather that for the first time we are finding that there are alternative technologies for delivering entertainment, news, and public affairs programming into the home. That's why the whole "public trustee" concept has to be re-examined, as well as the question of localism [licensing the local outlet even though programming usually originated elsewhere]. Because as soon as you start talking about introducing competition from another medium, the argument goes, and we've heard it time after time in our broadcast panel discussions, "But we're public trustees, we've providing something that you won't get with direct broadcast satellites, or you won't get with cable." Okay. Although it's not the same kind of regulated monopoly that AT&T has in the common carrier field, there's no question that the concept of "public trustee" is a shield against competition. Now, once having said that, there are legitimate questions as to what unfettered competition will provide in terms of services. But I feel a lot more happy just saying, let the public decide what it wants and how it wants to receive it.

CQ: Let me bring up the specific case that Mr. Wormington discussed last Wednesday.* He represents a group of independent stations in the UHF band and he told of how AT&T has filed new tariffs recently because they're worried about losing the video transmission business of the three major networks to satellites, and these new tariffs cut the price to the networks and raised the prices very substantially to the small occasional users, who are primarily independents. In the process they may soon eliminate some local sports and news coverage, and destroy the tiny Spanish-language network. They've certainly made it difficult for independent broadcasters to retain what little foothold they have in the commercial market. Can't we expect to see increased competition leading to discount prices for large users, so that they are in effect being subsidized by small users who have less market power?

Shooshan: Let me take a crack at that initally. There is no question that there are valid reasons for AT&T — or anyone else — saying that the bulk user ought to be provided discounts. As opposed to the guy who says, "I only want that circuit from Seattle when the Boston Red Sox are playing the Seattle Mariners," which is six times a year. I can see why it probably ought to cost him more than the guy who's using that circuit seven days a week, thirteen hours a day, throughout the year. I don't find anything antithetical in that suggestion. The problem comes when there are no alternatives. Now, satellites, I think, will be, and are becoming now, a viable alternative. I think one of the biggest decisions in the independent television area that was made last year at the Commission was a decision that was perceived initially as being of benefit primarily to small cable systems. That was the Small Earth Station decision, where the Commission allowed smaller than a nine-meter dish to be used. And while it's only a "receive only" capacity — you won't be able to send from it — the time is coming when you're going to be providing a real alternative for that independent television station. He can put up a

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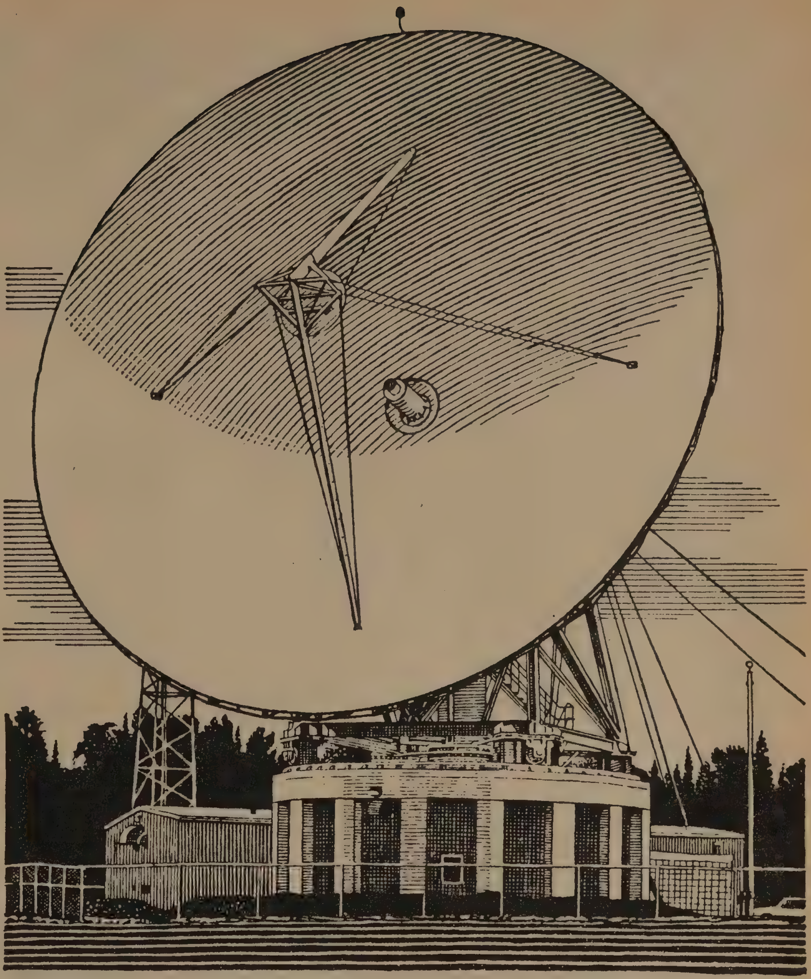
*Robert Wormington, of KMBA-TV (Kansas City, Missouri), appeared before the Subcommittee on the afternoon of September 21st. In the discussion following the panelists' opening statements, he asserted — and this was not contradicted by anyone present, including AT&T's representative — that the FCC had specified only that AT&T was entitled to a certain overall rate of return on its video transmission service, but was left free to choose from among several different formulas for allocating its service costs among the various classes of users. It happened to choose the one that was most favorable to the networks. Mr. Wormington later told me in private that in the rate-filing itself, AT&T had argued that unless they lowered their rates to the networks, they expected to lose the network's business entirely by 1979, drastically reducing their volume without comparably reducing their costs, and thus making it impossible for them to earn their lawful rate of return under *any* of the allocation formulas.

He also pointed out that satellites do not represent a complete substitute for video transmission by telephone, unless the news or sports event happens to occur very close to a satellite dish with *sending* capacity. Short of blanketing the country with such dishes, telephone lines leading to satellite earth stations will remain essential well into the foreseeable future, and it is these local line charges that are becoming so much more expensive.

dish and he can connect himself to other stations or he can connect himself directly with the program supplier. So in setting domestic satellite policy, you want to make sure that you allow for the economies and advantages of satellite technology to be realized by the user. There's no question that this occasional-user rate being jerked up is going to hurt in the short run, but it may force the independent broadcaster to look a little farther and longer down the road at some alternative technologies which heretofore they've ignored.

Margeson: The only thing I can add to that is, I want to make sure it's understood that the American Telephone and Telegraph Company didn't simply offer up these tariffs on its own motion. There has been now for about ten years a continuing controversy as to how AT&T should establish the cost of its various services. That was resolved recently with a Commission decision that specified a particular way for AT&T to identify what its costs are, and it was directed to re-file cost-justified rates in each one of its services, this program transmission service being one of those. Now, I have not personally looked at the tariff so I can't tell you whether or not AT&T did in good faith apply the cost allocation rules. Certainly that would be their position and we'll have to await the outcome of a Commission proceeding. But I mean we have to understand that this is being done pursuant to a Commission directive to re-file rates. One of the things that may grow out of this is an increased awareness of how rate-structure principles that are applied by the Commission are modified to take into account social goals.



THE RECENTLY BUILT SATELLITE EARTH STATION AT BARTLETT, ALASKA. IN 1970 THERE WAS A TOTAL OF 51 SUCH STATIONS THROUGHOUT THE WORLD.

CQ: Granted that there are valid economic arguments for cheaper rates for bulk users, still shouldn't social policy goals subordinate economic efficiency in a lot of these cases? I mean, as you yourself said in the hearings, following a purely economic argument might suggest that the most efficient system would leave one supplier per market, but we know that in the real world, that isn't necessarily the best system.

Margeson: Well, that sounds very altruistic to phrase it that way. Of course, all things equal, we'll subordinate economic efficiency to social goals. But who do you want to pick up the tab? If you're going to provide subsidized service to independent television stations then somebody's got to pay. Is it going to be the regular home telephone user? Is it going to be the long-distance telephone user? Are we going to dump everything on businesses? You can't escape. There are no free lunches here.

Shooshan: A point we made during our cable hearings was intended to go to the point you're making. And that was that what we've done in the cable area is to build hidden social subsidies into the cable rules. We've restricted the access of cable television to movies, sports events, those kinds of things, because of our concern that pay cable may prejudice the viewing availability to the poor. Do you follow me?

CQ: So cable companies can't bid for, and then charge for, high-priced programs?

Shooshan: Right. Arguably, everyone is paying the social cost through limited service — despite the fact that you or I might want to subscribe to that service for first-run movies or for sports events. You have to recognize that restrictive cable rules are in fact the substitute for a social subsidy. What we're asking is, isn't there a more efficient way of both recognizing those social costs and assessing them? Then we can decide maybe we need a direct subsidy. We're doing it in food stamps. Maybe we ought to do it in other areas, too.

Margeson: Telephone stamps.

Shooshan: No, I'm not recommending that, but I am suggesting that what we have to do all the way along is build social considerations into our regulation and if there is a way you can build them into a more efficient market-place, I would certainly opt for that.

Margeson: Arguably, consumers in this country are justified in distrusting everything utilities do. But, in my mind at least, there is an unfortunate tendency to assume that there are free lunches. Let me give you a specific example of what I mean. Even though it's a tiny example, I want you to understand that it pervades regulation. It has been proposed that the states authorize telephone companies to make directory-assistance charges. Every time you'd call up, you'd be charged ten cents. And everybody says, "Oh, that's awful!" and the Maryland legislature goes crazy. But the point that is missed is that we're already paying for that service. Those operators are there whether or not the charges are made. Those costs are incurred. The question is who shall bear the cost? Should we all just bear some average share of the cost, or should he who calls up ten times a day because he's too lazy to look in the telephone directory pay for causing those costs? This needs to be taken into account wherever we're talking about building in social considerations. Social considerations are absolutely important and anyone would be a fool, and would disserve the public, to pretend that they shouldn't be considered. But what we must always keep in mind and what we must always face up to, as we reluctantly conclude we can't play Santa Claus on every occasion, is that we also have to accept the responsibility for paying for those things.

Shooshan: There's talk now in political circles about the "second-look liberal" — that's certainly how I would characterize myself — the idea being that all of the liberal Great Society-New Frontier programs of the '60s, all of a sudden, people are beginning to realize, my god, those bills are now due. I mean, as Andy says, we're realizing that we have to pay both economic and social costs for those programs. To an extent, what we're trying to do is take a second look now, not at the necessity for these social considerations, but at how to factor them in. When you stop to think about it, the biggest social subsidy of all is in commercial television. There are a lot of people, from what I hear, who watch it very little, who just find their needs totally unserved by it. Yet all of us are paying for commercial television every time we buy a product at the store. Those social costs of having a "universal" system of broadcasting are built into every product that's advertised, and we're paying for it. Now, once we recognize that, all we're saying is, let's ask the question: is that the way we want it to be? Or do we want it to be more that the person who uses the service bears the cost of the service, whether it's telephone service or broadcasting or whatever.

CQ: If I could put this argument into short form, would this be it: introducing more competition will force the prices of communications services to reflect their real costs. And then, once the situation stabilizes, having identified the real costs, we can decide whether some services should be subsidized for certain classes of users? Is that it?

Margeson: That sounds pretty good to me.

Shooshan: I hadn't thought about it in those terms, but that's really what we're all about. That seems to be the direction we're heading.

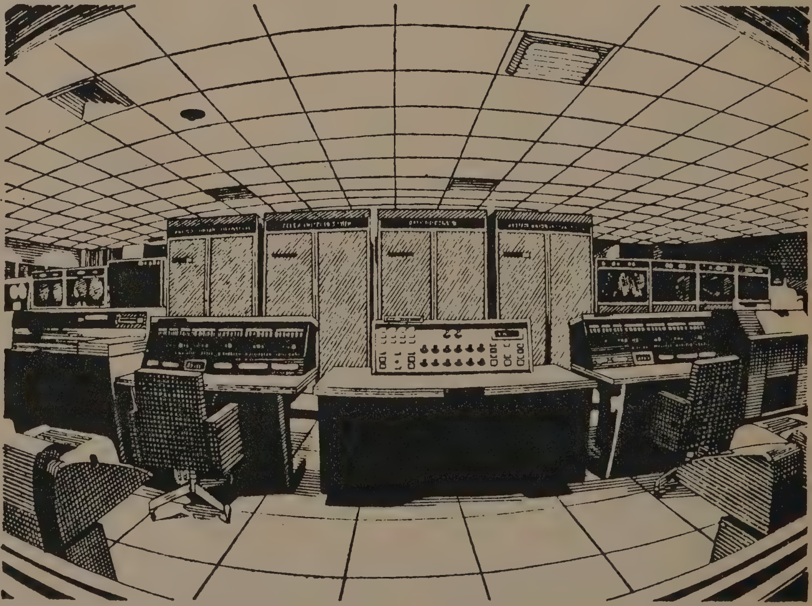
CQ: To a certain extent, that makes complete sense. But you can also look at it cynically, if you think of Congress as a utility [Margeson laughs], and say, well, they're unable to formulate social goals, or unwilling to, so what they're doing is using economic theory as a substitute now to structure the law, and postponing the hard political questions and postponing the definition of social goals until later, when it comes time to vote the subsidies. How would you respond to that?

Margeson: I think that we'll face up to what the social goals are and I think that we will provide a mechanism for realizing them, and I think we'll recognize the cost. I don't think that we intend to shirk our responsibility here, and the fact that we've had these hearings, day after day after day, throughout the session, on every aspect of communications policy, I think demonstrates a commitment on our part to face up to what the social policies should be. You heard Mr. Frey asking virtually every witness, "Well, what should the social policy be? What is it that we should guarantee as a matter of social policy?" That demonstrates the commitment of a man determined to specify what it is that we have a social policy in favor of. That's why we're rewriting the Communications Act of 1934 and that's why we hope to do a better job.

Shooshan: Our judgment and the judgment of the Congress may be flawed, but after recognizing that that process of defining social goals did not take place when the '34 Act was put together, we're trying to force that to be done now. That's where this whole series of policy discussions and hearings is leading to. I mean, people are saying about Andy's hearings, "Now we're talking about the real issues, we're down to it now," because a lot of the rhetoric has been stripped away. I think we almost got to that point in the broadcast hearings. I think we'll do it in cable. I think we've done it already in international common carrier, and in the next round, we'll get there even further.

CQ: Okay, one final question. At this point, are you optimistic or pessimistic that when the bill finally comes out of committee and goes through the gauntlet in the Congress that it will emerge in some kind of form that you will be happy with?

Shooshan: Well, it's not really important whether or not I'm happy with it, but I have never been more encouraged than I am right now that this project is going to be successful. You have to look at success on some different levels, though. Number one is that this rewrite project, which Mr. Van Deerlin and Mr. Frey conceived, has sparked the most intensive and comprehensive discussion of communications that's ever been held in this city, in all of the areas. In the past, everybody was focussing on broadcast matters. It's a whole new ballgame right now. That's one success I think that's already been achieved. Second, we're forcing not just discussion but discussion on the real issues, as we indicated before. It's going to help policy-makers in other areas to make better decisions — in the Executive branch, at the FCC, in the industry, and the public, let alone ourselves and the Congress as a whole. There are still a lot of people who are hoping the project will sort of go away. It won't. The third level is the success or failure of the legislation itself. And, as I say, I'm very encouraged that as legislation it will successfully make its way through the legislative process reasonably intact. What it will look like, since we haven't begun to draft, I couldn't begin to tell you. But we have not missed a single deadline yet for what we've had to do. We will have a draft ready for introduction early in the next Congress. Part of the unanswered part of the question that I leave with you is what will be done in terms of an Administration position, and in terms of the Senate's response. Those are largely out of our hands at this point. ■



WESTERN UNION INTERNATIONAL INTRODUCED THE FIRST FULLY COMPUTERIZED TELEX SWITCHING SYSTEM IN AUGUST 1966.

World Television

BY MARY JEAN HALEY

Almost everyone who writes about television around the world mentions breathlessly that through the miracle of satellite transmission, 723 million people, or roughly one-fifth of the planet's population, watched the moon landing in July 1969. We are reminded that almost every American who wasn't in a coma or a cave-in watched John F. Kennedy's funeral six years earlier. Others tell us that at least 400 million people in 82 countries see *Bonanza* every week. *I Love Lucy* still goes out in five languages. We hear about the global village. We are told television has created a community of experience unprecedented in human history. Given the nature of the material shared and the essentially inactive quality of the experience of watching television, it is hard to say what this shared experience means.

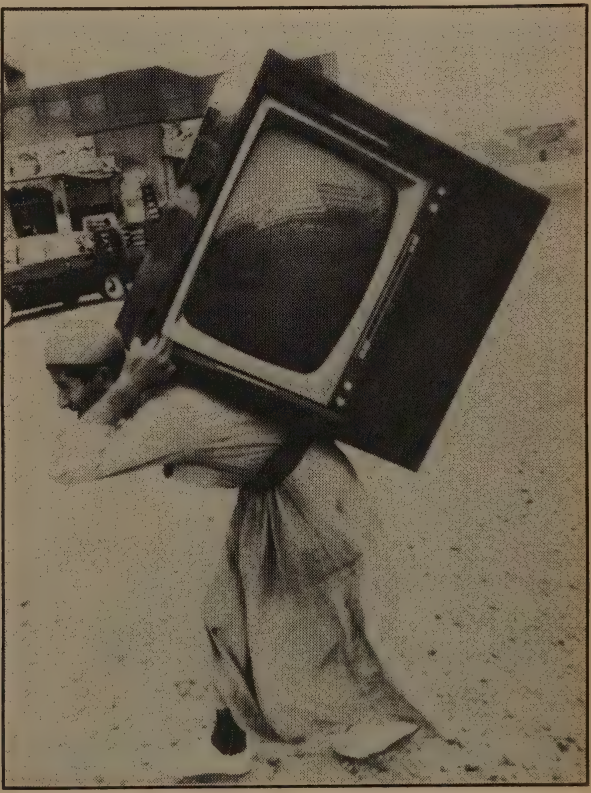
If you still think of television as an American phenomenon, with perhaps a tip of the hat to the BBC, you are at least ten years out of date. In Japan, where the average person spends twice as much time watching TV as Americans do, 85% of all programs and every one of the top 20 are home grown. Mexico's tele-novelas, long rambling tales about girls from the country who come to the city and get the guy or almost get the guy, are top sellers all over the Spanish-speaking world. Kenya, where much of black Africa's television industry is trained, bans *all* violence, and therefore most American programs, from its screens.

Americans blame sponsors for the vacuousness and vulgarity of most TV programs, but from Finland to Hong Kong, the most powerful factor in determining programming is not the sponsor but the politician. The American serial, once the staple of the international television market, is fading from the world's screens, its demise hastened by rising nationalism abroad and the anti-American sentiment fueled by the Viet Nam War years. By the late 1960's governments everywhere feared the tread of the great blue leveler. They recognized that if television could be used to convince 200 million people to buy billions of dollars of often nonsensical consumer goods as well as play a major role in electing the leaders of the most powerful country in the world, it was influencing their citizens too. Country after country has limited the percentage of foreign programming that can be broadcast over its transmitters, sometimes preferring hours and hours of underbudgeted amateurishness to insidious foreign professionalism.

Totalitarian regimes everywhere rigidly control television, honoring the fact that all the secret police and prisons they can muster have only a fraction of the persuasive power of the tube. In an apparent attempt to combine two coercive forces, Iraqi TV has featured the questioning and execution of political dissidents on, there seems no other way to say it, live broadcasts. It has become a cliche in the Latin American and African television industries that the first sign of a coup is the arrival of soldiers at the television station. Shortly after Fidel Castro fought his way out of the hills and into Havana, he began to deliver marathon speeches on TV. He has reportedly never talked for less than four hours and has gone on as long as six.

Where advertisers or generals aren't using the television to shape minds, other forces are. The Catholic Church, for example, has been a major influence in Italian television. Meanwhile the Dutch try to keep the tube from imposing a homogeneous world view on its populace by means of an elaborate equal time systems which allows any group with over 15,000 members to buy a TV license and receive a programming slot based on the size of the group.

Obviously, the American commercial method is only one of many ways to run a television system. The rapidly expanding Soviet system, which may be the best equipped in the world, promotes socialist achievement as rigorously as we sell deodorant. In all of Europe, only Spain and Monaco have wholly commercial networks, and Spain's is run by the Ministry of Information, which retains some of the commercial profits. Many countries support their television



from **Design for the Real World,** *a Bantam Book* industry by charging set owners a yearly licensing fee. Fees tend to be fairly low in countries like Ireland and Portugal and quite high in Scandinavia, but avoiding the license fee is a minor national sport almost everywhere.

No matter how a television system is financed, production costs are rising all over the world. By 1972, 90 of the 130 countries which then had TV were selling ads whether they also collected licensing fees or not. Spot ads rather than program sponsorship are usually sold to avoid sponsor control of program content. No European nation allows ads for candidates or political parties at election time. This may be highly enlightened, or it may mean that only those already in power have access to television time. Access, it would seem, is a function of money or power almost everywhere.

Of course, all the TV time in the world won't deliver your message in those parts of the world where people cannot afford a TV set much less the luxuries it shows

WORLD TELEVISION

The chart which follows is compiled from data which are almost all over five years old — the most recent I could find. If anyone out there knows of more recent, thorough work, I would be delighted to hear about it. When you are reading the chart, keep in mind political shifts which may have rendered the information obsolete. Remember that in countries where TV sets are licensed, the number of sets is based on the number of licenses and is probably low. I have usually marked the sources. G stands for Timothy Green's fine book, **The Universal Eye: World Television in the Seventies** (1972). PNB stands for a Pacific Nations Broadcasting Conference (1974). N stands for the Network Project "Notebook Number Ten," (1975).

Country	Year TV Started	No. of Sets	Govt. or Private Control	Ads or Licensing	Average Hours Watched	Origin of Programming	Comments
USA	1939	474 sets/1000 people (UN, 1972) 96.9 million (PNB)	Regulated private & govt. owned & operated	Ads	Set on 6 hours/ day	Most USA	In 1972, 95.8% of all households had at least one set.
Cuba	1950's	71 sets/1000 people (UN, 1968) 575,000 (UN)	Govt. owned & operated	No licenses	136 hrs. & 40 min. broadcast/wk.	All Cuban	Fidel Castro is a major TV personality.
Brazil	1950's	One set for every 15 people (G) 67 sets/1000 people (UN, 1972)	Both	Ads	No data	2955 hrs/wk of 3999 hrs/wk broadcast of local origin (UN, 1971)	Time-Life backed development of TV Globo and lost its shirt. People wanted the things advertised but couldn't afford them. Ad revenues evaporated.
Finland	No Data	256 sets/1000 people (UN, 1972) 1.2 million sets (NP)	State owns 92%	Ads provide 42% of income, rest from licensing fees	56 hrs & 52 min/ week broadcast in 1972	40% imported. Finland Mainos TV originates 49%, 94% of serial time from USA in 1969, rest French. Finnish Broadcasting Co. gets 50% of imports from USA, 33% from Britain.	Only Scandinavian country with ads. Licensing fee among world's highest. Like all Scandinavian countries has prime season, winter, and shuts down one channel in summer. Finnish TV got too liberal in the 60's. Public backlash has resulted in a programming "ice age." (G)
France	After 1950	237 sets/1000 people (UN, 1972) 13.5 million sets (NP)	Govt.	Both. No sponsorship, spot ads in evening	15.7 hrs/wk	Only 13% foreign. 75% of that from USA, most of rest from Britain	Third in Europe, after West Germany and Britain in set ownership. Since DeGaulle, govt. control has loosened & some efforts are being made to restore credibility to the news. France gives its programs free to its former Africa colonies, maintaining the old tie through television.
United Kingdom	1936, world's first regular service	305 sets/1000 people (UN, 1972) 16 million	Regulated private & govt. owned & operated	BBC 1 & BBC 2, licensing; ITV, ads	Set on 4 hours a day	Limits imports to 14%. BBC produces 80% of own programs	Popularly regarded as finest programming anywhere. Popularity of ITV threatens BBC, which can't up license fees enough to compete.
USSR	1939	183 sets/1000 people (UN, 1972) 45 million	Govt.	Licensing	Main channel broadcasts 11 hrs/ day	Only outside programs are international soccer & ice hockey	Probably best equipped system in the world. Has own satellite system to span the ten time zones. They sell socialist achievement like we sell cars.

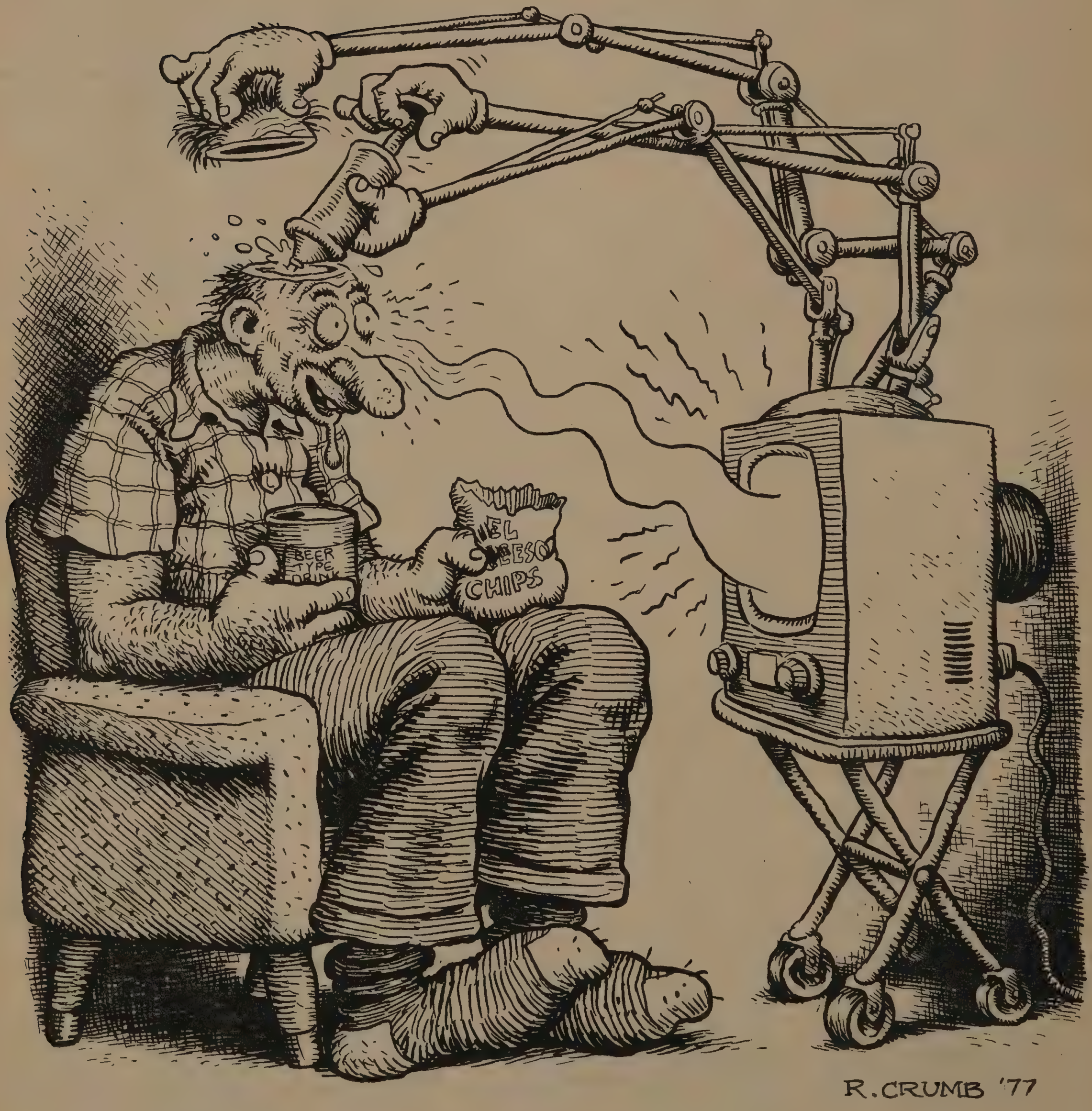
them. In addition, the climate in much of Africa and South America simply eats metal, and television sets have proven ridiculously fragile. Finally, a satellite signal may span the globe, but it can only be received where there is electricity. A Peruvian communications minister once lamented that a kerosene-powered TV would solve a lot of problems.

Despite these obstacles, the non-TV watchers of the world are dwindling. Revolutions may change its programming, wars may disrupt it, but whether it is used for education, entertainment or propaganda, television will be with us for the foreseeable future. It rests cozily in our homes, so familiar an object that we overlook the power it has over us. If it were a drug or a religion, the world might view its spread with alarm or at least amazement. As things stand now, no one, including UNESCO, seems to be collecting or analyzing information about the spread of television. No one really seems to be able to tell us what it means or what we can expect its long term effects to be. ■

Country	Year TV Started	No. of Sets	Govt. or Private Control	Ads or Licensing	Average Hours Watched	Origin of Programming	Comments
Egypt	No data	17 sets/1000 people (UN, 1971) 600,000	Govt.	Both	No data	Used lots of American TV in 1972, probably less now.	Nasser, like Castro, used TV to become known to the people. Best system in Arab world. RCA built network while USSR built Aswan dam. Sets too expensive for most people. Egyptian programs unpopular in rest of Middle East, considered too indoctrinating.
Israel	1966	120 sets/1000 people (UN, 1972) 430,000 (NP)	Govt.	Licensing	No data	At least two-thirds local in 1973	Ben-Gurion opposed TV, so it was introduced late. Switched to UHF to avoid Arab programs. American series from Jordan so popular, had to lighten up educational emphasis in 1969. Participates in Middle East TV war, beaming propaganda programs at Arab states.
Jordan	No data	28 sets/1000 people (UN, 1972) 85,000 (NP)	Govt.	Licensing	No data	Used lots of American TV in early 70's. Safer than making own programs & risking offending neighbors. In 1973 made about one-sixth locally.	Makes a lot of programs intended to be beamed at Isreal. Has one well-equipped station built with the help of New York-based Radio Television International.
Kenya	No data	3 sets/1000 people (UN, 1972) 37,000	Govt. regulated public corporation	Licensing	No data	40% produced locally	Probably world's strictest rules about violence. No killing, shooting, stabbing, fighting or poisoning. Keeps out most US TV. Nairobi school trains other African TV crews.
India	1959	0.1 sets/1000 people. Almost no one can afford a set.	Govt.	Licensing	No data	Almost all produced locally	TV began as UNESCO project on TV as an educational aid. Satellite used to beam programs on agriculture and health to community centers. Apparently popular.
Japan	1953	225 sets/1000 people (UN, 1972) 27 million (NP)	Regulated private & govt. owned & operated	Ads	Set on 5 hrs/day	85% produced locally. All top 20 are local.	World's most compulsive viewers. Most Japanese spend at least half their leisure time watching TV. During prime time, as much as ten minutes of ads an hour. Messages are sometimes flashed on the screen without interrupting the program.
Hong Kong	English in 1957 Chinese in 1963	164 sets/1000 people (UN, 1972)	British control policy of commercial channels	Both. About 25% of programs sponsored	362 hrs. broadcast/week (UN, 1973)	Most English programs are foreign. Most Chinese programs are local and are very popular throughout Asia.	Much effort made to avoid offending People's Republic. First 10 years used only cable. Broadcasting beams away from mainland. British stance that crown colony has no politics, so no political programs. No religion either.

Four Arguments for the Elimination of Television

By Jerry Mander



These are some selected passages from the book Four Arguments for the Elimination of Television, *written by former advertising executive Jerry Mander, to be published by William Morrow and Company this March. What makes this book a complete departure from previous writings about television is that it argues that television is not reformable, that its problems are inherent to the technology itself. Mander is in close agreement with Gene Youngblood about the intimate relation between TV and the current eco-social crisis, and the awesome power of television to shape our evolution. However, their conclusions are radically different. TV or not TV? That is the question. Where do you sit? Let us know.*

—SN

The Illusion of Neutral Technology

(From the Introduction to the Book)

Most Americans will argue that technology is neutral, that any technology is merely a benign instrument, a tool, and depending upon the hands into which it falls, it may be used one way or another. There is nothing that prevents a technology from being used well or badly; nothing intrinsic in the technology itself or the circumstances of its emergence which can predetermine its use, its control or its effects upon individual human lives or the social and political forms around us.

The argument goes that television is merely a window or a conduit through which any perception, any argument or reality may pass. It therefore has the potential to be enlightening to people who watch it and is potentially useful to democratic processes.

It will be the central point of this book that these assumptions about television, as about other technologies, are totally wrong.

If you once accept the principle of an army — a collection of military technologies and people to run them — all gathered together for the purpose of fighting, overpowering, killing and winning, then it is obvious that the supervisors of armies will be the sort of people who desire to fight, overpower, kill and win, and who are also good at these assignments: generals. The fact of generals, then, is predictable by the creation of armies. The kinds of generals are also predetermined. Humanistic, loving, pacifistic generals, though they may exist from time to time, are extremely rare in armies. It is useless to advocate that we have more of them.

If you accept the existence of automobiles, you also accept the existence of roads laid upon the landscape, oil to run the cars, and huge institutions to find the oil, pump it and distribute it. In addition you accept a speeded-up style of life and the movement of humans through the terrain at speeds that make it impossible to pay attention to whatever is growing there. Humans who use cars sit in fixed positions for long hours following a narrow strip of gray pavement, with eyes fixed forward, engaged in the task of driving. As long as they are driving, they are living within what we might call "roadform." Slowly they evolve into car-people. McLuhan told us that cars "extended" the human feet, but he put it the wrong way. They *replaced* them.

If you accept nuclear power plants, you also accept a techno-scientific-industrial-military elite. Without these people in charge, you could not have nuclear power. You and I getting together with a few friends could not make use of nuclear power. We could not build such a plant, nor could we make personal use of its output, nor handle or store the radioactive waste products which remain dangerous to life for thousands of years. The wastes, in turn, determine that *future* societies will have to maintain a technological capacity to deal with the problem, and the military capability to protect the wastes. So the existence of the technology determines many aspects of the society.

If you accept mass production, you accept that a small number of people will supervise the daily existence of a much larger number of people. You accept that human beings will spend long hours, every day, engaged in repetitive work, while suppressing any desires for experience or activity beyond this work. At work their behavior is subject to the machine. With mass production, you also accept that huge numbers of identical items will need to be efficiently distributed to huge numbers of people and that institutions such as advertising will arise to do this. One technological process cannot exist without the other, creating symbiotic relationships among technologies themselves.

If you accept the existence of advertising, you accept a system designed to persuade, and to dominate, minds by interfering in people's thinking patterns. You also accept that the system will be used by the sorts of people who like to influence people and are good at it. No person who did not wish to dominate others would choose to use advertising, or choosing it, succeed in it. So the basic nature of advertising and all technologies created to serve it will be consistent with this purpose, will encourage this behavior in society, and will tend to push social evolution in this direction.

In all of these instances, the basic form of the institution and the technology determines its interaction with the world, the way it will be used, the kind of people who use it, and to what ends.

And so it is with television.

* * *

The Four Arguments

The first argument is environmental and theoretical. It is not about television itself, except insofar as it is

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typical of the way the whole of contemporary American life effectively confines, narrows and controls what human beings are capable of experiencing and knowing. With natural environments having been replaced and remade into a new artificial form (cities, suburbs), environment itself has become media, an intervention between humans and direct personal experience and knowledge of natural process. It is within this deprived environment that an instrument like television can come along and seem potentially interesting, useful, sane and worthwhile at the same time that it further accelerates the channelization process. Knowledge becomes subject to technological gathering and dissemination. What we celebrate as the expansion of human knowledge is really only its confinement within a singular cerebral mode, while varieties of other human experience and the personal knowledge that goes with them begin to atrophy.

The second argument is economic and political. That television would be used as an instrument of psychic colonization and human domination by a way of mind and lifestyle that suits only one form of political organization was inevitable and should have been predictable at the instant of its invention.

The third argument concerns the neuro-physiological responses of human beings to the television signal. Various radiations may cause physical illness. The TV signal itself produces a hypnotic-addictive effect. Television is a probable cause of hyper-activity. It surely suppresses conscious thinking and creative imagination. In many ways television is akin to sense deprivation, leaving the viewer lost within images which have been implanted, unable to discern the real from the not-real. The images themselves, following psycho-physiological channels, have the power to transform humans into copies of themselves. We become what we see. Taken together, these effects leave a viewer in an appropriate mental condition for autocratic intervention.

The fourth argument shows that television has only limited potential for improved programming, and no potential for democratic use. Aside from the venality of its controllers, the technology of television defines the boundaries of its content. Some information can be conveyed completely, some in only a very distorted way, but most information which would be useful to thorough human understanding of the complexities of existence cannot penetrate the medium at all. The effect is to confine the information field within the very narrow, hard-edged and objective form which the medium can convey, creating, in turn, hard-edged, narrow minds. The mentality which emerges is one which nicely fits a simplified and, thus far, commercialized life. What is revealed in the end is that there is ideology in the technology itself. To speak of television as "neutral" and therefore subject to change is as absurd as speaking of the reform of a technology such as guns.

WE MAY HAVE ENTERED AN ERA WHEN INFORMATION IS FED DIRECTLY INTO THE MASS SUBCONSCIOUS.

THE TV SIGNAL ITSELF PRODUCES A HYPNOTIC-ADDICTIVE EFFECT.

* * *

Television Is Sleep Teaching

(From Argument Three, Chapter 10)

When you are watching television and believe you are looking at pictures, you are actually looking at the phosphorescent glow of three hundred thousand tiny dots. There is no picture there.

These dots seem to be lit constantly, but in fact they are not. All the dots go off thirty times per second, creating what is called the flicker effect of television, which is similar to strobe or ordinary fluorescent light.

For many years conventional wisdom held that since this flickering happens at a rate beyond the so-called flicker-fusion rate of the human eye, we do not consciously note it, and we presumably are not affected by it. However, recent discoveries about the biological effects of very minor stimuli by W. Ross Adey and others, and the growing incidence of television epilepsy among those particularly sensitive to flicker, have shown that whether we consciously note the flicker or not, our bodies react to it.

A second factor is that even when the dots go "on," not all of them are lit simultaneously. Which dots are on determines the picture. In a sense, the television screen is like a newspaper photograph or the images on a film, which are also comprised of dots, except that the television dots are lighted one at a time according to a scanning system that starts behind the screen. Proceeding along a line from the upper-right-hand portion of your screen across the top to the left, the scan lights some dots and skips others, depending upon the image to be conveyed. Then the scan goes down another line, starts at the right again and goes across to the left and so on.

What you perceive as a picture is actually an image that never exists in any given moment but rather is constructed over time. Your perception of it as an image depends upon your brain's ability to gather in all the lit dots, collect the image they make on your retina in sequence, and form a picture. The picture itself, however, never existed. Unlike ordinary life, in which whatever you see actually exists outside you before you let it in through your eyes, a television image gains its existence *only* once you've put it together inside your head.

As you watch television you do not "see" any of this fancy construction work happening. It is taking place at a rate faster than the nerve pathways between your retina and the portion of your brain that "sees" can process them. You can only see things that happen within a range of speeds. This is because four million years of human evolution developed our eyes to process only that data which were concretely useful. Until this generation, there was no need to see anything that moved at electronic speed. Everything that we humans can actually do anything about moves slowly enough for us to see.

Even though you don't see every dot go on and off in sequence these events are happening. Your retina receives the light continuously and your brain cells record their reception. The only thing that doesn't happen continuously is the translation of the energy into images inside your head. That happens only at about ten times per second. Television is sending its sequential images at thirty times per second.

A few years ago there was a big fuss about advertisers exploiting the differential in these rates. A technique called subliminal advertising places images within the dot-sequence at a speed which is faster than sight. You get hit with the ad, but you can't process this fast enough, so you don't know the ad is registering. Your seeing processes are plodding along at nonelectronic speed while the advertisers have access to electronic speed. Your brain gets the message, but your conscious mind doesn't. According to those who have used the technique, it communicates well enough to affect sales.

AND I'M SURE YOU DON'T NEED THIS.!!
GRAB HIM!
OH NO YA DON'T!
GET'M!

For the entire four hours or more per day that the average person is watching television, the repetitive process of constructing images out of dots, following scans, and vibrating with the beats of the set and the exigencies of electronic rhythm goes on. It was this repetitive, nonstop requirement to reconstruct images that are consciously usable that caused McLuhan to call television "participatory," another unfortunate choice of words. It suggests exactly the opposite of what is going on.

I wish he had said "overpowering." The word "participatory" has been passed around at thousands of cocktail parties, misleading people to assume that if only they could have managed to get through McLuhan's books, they'd have discovered that their innate feeling (anecdotal evidence) that the experience is passive and that it "deadens my mind" was somehow wrong. In fact, watching television is participatory only in the way the assembly line or a hypnotist's blinking flashlight is. Eventually, the conscious mind gives up noting the process and merges with the experience. The body vibrates with the beat and the mind gives itself over, opening up to whatever imagery is offered.

One sensitive correspondent, Jack Edelson, described his feeling that "the images seem to pass right through *me*, they go way inside, past my consciousness into a deeper level of my mind, as if they were dreams."

From what we know of how the images are formed, it is possible to understand this.

I have described the way the retina collects impressions emanating from dots. The picture is formed only after it is well inside your brain. The image doesn't exist in the world, and so cannot be observed as you would observe another person, or a car, or a fight. The images pass through your eyes in a dematerialized form, invisible. They are reconstituted only after they are already inside your head.

Perhaps this quality of nonexistence, at least in concrete worldly form, disqualifies this image information from being subject to conscious processes: thinking, discernment, analysis. You may think about the sound but not the images.

Television viewing may then qualify as a kind of wakeful dreaming, except that it's a stranger's dream, from a faraway place, and it plays against the screen of your mind.

The stillness required of the eyes while watching the small television screen must be another contributor to this problem of feeling by-passed by images proceeding merrily into our unconscious minds. There are hundreds of studies to show that eye movement and thinking are directly connected. The act of seeking information with the eyes requires and also *causes* the seeker/viewer to be alert, active, not passively accepting whatever comes. There are corollary studies which show that when the eyes are not moving, staring zombielike, thinking is diminished.

Television images are not sought, they just arrive in a direct channel, all on their own, from cathode to brain. If indeed this means that television imagery does bypass thinking and discernment, then it would certainly be more difficult to make use of whatever information was delivered into your head that way. If you see a person standing in your living room, you can say, "There is a person; how do I feel about this?" If, however, the person is not perceived until she is constructed inside your unconscious mind, you'd have to bring the image up and out again, as it were, in order to think about it. The process is similar to the way we struggle to keep our dream images after waking.

If television images have any similarity to dream imagery, then we have one explanation for a growing confusion between the concrete and the imaginary. Television is becoming real to many people while their lives take on the quality of a dream. It would also amplify recent studies, quoted by Marie Winn and many others, that children are showing a decline in recallable memory and in the ability to learn in such a way that articulation and the written word are usable forms of expression. We may have entered an era when information is fed directly into the mass subconscious.

In Chapter Eight I referred to a fascinating study of television completed in 1975 by a team of researchers headed by psychologists Merrelyn and Fred Emery at the Center for Continuing Education, Australian National University at Canberra. It caused a sensation in Australia but was barely noted in America.

The Emery report acknowledges, with a certain degree of rage, that its findings are not based on great amounts of evidence. The authors remark that it is tantamount to scandal that there has been so little research on the neurophysiology of television viewing.

Nonetheless, they were satisfied in the end that when we watch television, our usual processes of thinking and discernment are semifunctional at best. They conclude that while television appears to have the potential to provide useful information to viewers — and is celebrated for its educational function — the technology of television and the inherent nature of the viewing experience actually inhibit learning as we usually think of it. Very little cognitive, recallable, analyzable, thought-based learning takes place while watching TV.

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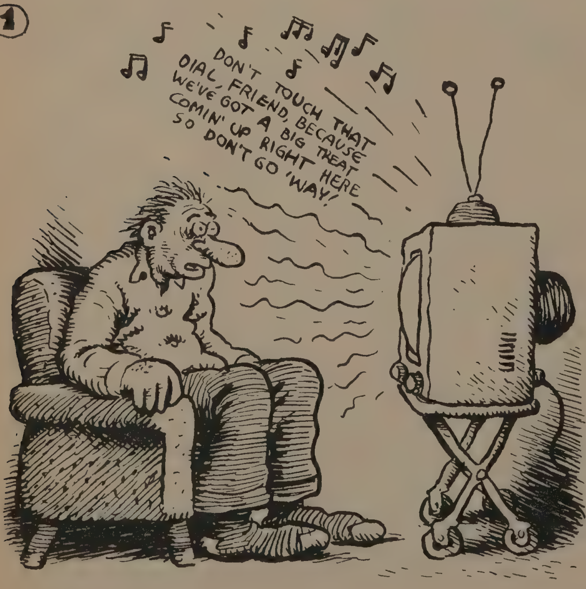
DON'T TOUCH THAT DIAL FRIEND BECAUSE WE'VE GOT A BIG TREAT COMIN' UP RIGHT HERE SO DON'T GO 'WAY!

The report says: "The evidence is that television not only destroys the capacity of the viewer to attend, it also, by taking over a complex of direct and indirect neural pathways, decreases vigilance — the general state of arousal which prepares the organism for action should its attention be drawn to specific stimulus.

"The individual therefore may be looking at the unexpected or interesting but cannot act upon it in such a way as to complete the purposeful processing gestalt.

"The continuous trance-like fixation of the TV viewer is then not attention but distraction — a form akin to daydreaming or time out."

IT IS TANTAMOUNT TO SCANDAL THAT THERE HAS BEEN SO LITTLE RESEARCH ON THE NEUROPHYSIOLOGY OF TELEVISION VIEWING.

The report explains that since television information is taking place where the viewer is not, it cannot be acted upon. The viewer must deliberately inhibit the neural pathways between visual data and the autonomic nervous system, which stimulates movement and mental attention. To do otherwise than inhibit the process would be ridiculous. The viewer is left in a passive but also frustrated state.

The authors present a forty-page technical treatise summarizing relevant brain research to trace the effects on the mind of a "simple, constant, repetitive and ambiguous visual stimulus," particularly upon the left side of the brain, the area where language, communicative abilities, cognitive thought — comprehension — are organized.

"The nature of the processes carried out in the left cortex and particularly area thirty-nine [the common integrative area] are those unique to human as opposed to other mammalian life. It is the centre of logic, logical human communication and analysis, integration of sensory components and memory, the basis of man's conscious, purposeful, and time-free abilities and actions. It is the critical function of man that makes him distinctively human."

The Emerys say that the evidence shows that human beings "habituate" to repetitive light-stimuli (flickering light, dot patterns, limited eye movement). If habituation occurs, then the brain has essentially decided that there is nothing of interest going on — at least nothing that anything can be done about — and virtually quits processing the information that goes in. In particular, they report, the left-brain "common integrative area" goes into a kind of holding pattern. "Viewing is at the conscious level of somnambulism," they assert.

The right half of the brain, which deals with more subjective cognitive processes — dream images, fantasy, intuition — continues to receive the television images. But because the bridge between the right and left brains has been effectively shattered, all cross-processing, the making conscious of the unconscious data and bringing it into usability, is eliminated. The information goes in, but it cannot be easily recalled or thought about.

If the Emerys are correct, then their findings support the idea that television information enters unfiltered and whole, directly into the memory banks, but it is not available for conscious analysis, understanding or learning. It *is* sleep teaching.

All of this helps explain recent findings that children, after watching television, have difficulty recalling what they have just seen. Whatever "knowledge" they gain is the sort that passes through the conscious regions where it would be available for recall and use.

Television as sleep teaching would also help explain my own observations, from political work, that the more that public issues are confined to television, the *less* knowledgeable the public seems to be about them. The voter cannot process information he or she is apparently receiving. When Carter and Ford made their implicit agreement to avoid content and concentrate on style, they were right on the mark.

The Emerys report at length upon one study that measured brainwave activity during television viewing.

It established that no matter what the program is, human brainwave activity enters a "characteristic" pattern. The response is to the medium, rather than to any of its content. Once the set goes on, the brain waves slow down until a preponderance of alpha and delta brain waves become the habitual pattern. The longer the set is on, the slower the brainwave activity.

The Emerys explain that slow, synchronous brainwave activity is ordinarily associated with "lack of eye movement, fixation, lack of definition, idleness, inactivity, overall body inertness." They quote from A.R. Luria, who writes in **The Psychophysiology of the Frontal Lobes**: "No organized thought is possible in these phasic states and selective associations are replaced by non-selective association, deprived of their purposeful character."

ADVERTISING WORKS. ADVERTISERS DON'T CARE AT ALL IF YOU KNOW THE ADVERTISING IS FICTIONAL.

Alpha is the mental state most commonly associated with meditation, but before anyone equates meditation with television, it's important to make a critical distinction. In the former, you produce your own material and in the latter it comes from outside; it is not internally generated. Dr. Freda Morris, the psychologist-hypnotist quoted earlier, told me that people who are good at meditation are among the most difficult to hypnotize. "They start going into hypnotic trance, but at a certain point they begin producing their own material and cannot be influenced by outside instruction unless they choose to be. They've got their own thing going." She told me that she doubted that good meditators watch much television and added that meditation might be an excellent ability to develop in people who are bothered by television addiction. In fact, she said, television addiction might itself be symptomatic of an inability to produce one's own mental imagery.

Herbert Krugman, a Florida researcher whose brainwave work the Emerys drew upon, compared brainwave activity while watching television to brainwave activity while reading magazines.

"It appears that the mode of response to television is . . . very different from the responses to print . . . the basic electrical response of the brain is clearly to the medium and not to the content differences," said Krugman. "The response to print may be fairly described as active . . . television is not communication as we have known it. Our subject was trying to learn something from a print ad, but was passive about television. . . . *Television is a communication medium that effortlessly transmits huge quantities of information not thought about at the time of exposure.*" (My italics.)

ECOLOGISTS WOULD BE WISE TO ABANDON ALL ATTEMPTS TO PUT NATURE ON TELEVISION.

I took the Krugman report and the Australian study to Dr. Erik Peper, a widely published researcher on electroencephalographic (brainwave) testing, formerly associated with MIT, currently a professor of interdisciplinary sciences at San Francisco State University.

It turned out that Peper had worked on a study similar to Krugman's.

"Krugman's statement is correct," he told me. "You get a decrease in beta [fast waves] and an increase in slow activity with a large percentage of alpha."

I asked Peper to explain the meaning of this.

"Alpha wave patterns disappear at the moment when a person gives visual commands, when he takes charge of the process of seeking information. Any orienting outward to the world increases your brainwave frequencies and blocks [halts] alpha wave activity. Alpha occurs when you don't orient *to*. You can sit back and have pictures in your head, but you are in a totally passive condition and unaware of the world outside of your pictures. The right phrase for alpha is really 'spaced-out.' When a person focuses visually, or orients to anything, notices something outside himself, then he or she gets an immediate increase in faster wave activity and alpha will block [disappear]. Many meditators are in alpha but in meditation you are learning self-control and how to call upon your own internal processes. There is no such discipline with television. You are not training your mind to control itself, which biofeedback, and also meditation, accomplish; television trains people only for being zombies. Instead of training active attention, television seems to suppress it."

I asked Peper to describe the experiment he worked on.

[more→]

"As far as I know, this study is the only one that has been made, aside from Krugman's. We took ten kids and asked them to watch their favorite television programs. Our assumption was that since these programs were their favorite shows, the kids would be involved in them and we'd find there'd be an oscillation between alpha slow-wave activity and beta. The prediction was that they would go back and forth. But they didn't do that. They just sat back. They stayed almost all the time in alpha. This meant that while they were watching they were not reacting, not orienting."

TELEVISION VIEWING MAY QUALIFY AS A KIND OF WAKEFUL DREAMING, EXCEPT THAT IT'S A STRANGER'S DREAM.

I told Peper about a study which showed that children who were watching television were far slower to react to an emergency than children who were doing something else.

"That's predictable," Peper said. "When they are watching television they're being trained not to react."

He then volunteered his own thoughts about television as an educational medium: "To really learn anything, you have to interact with the source of the data. With television you don't really think. I know that speaking for myself, I can only really learn if I get engaged, as in the Socratic method of teaching. The best teaching is an interactive form. Some people learn best, for example, by writing notes because the notes are a feedback system." (Like a journal or a diary.)

"Television watching is only receiving," he went on, "no longer reacting. It can't do anything but hold your attention; you are receiving, not looking. The key for why they're in alpha is that when they're watching they're not looking *at*, not orienting. This is all by way of totally agreeing with Krugman. If you have a light which is not really being attended to, you can get an infinite amount of alpha. Perhaps it's that the TV target is so far away, the screen so small that your eyes needn't move; you're looking at infinity, in a way, like looking at the hypnotist's flashlight. If you look at moving targets, you have at least a little active interaction; that would tend to put you into beta. But with television though there seems to be movement, you stay all the time in alpha."

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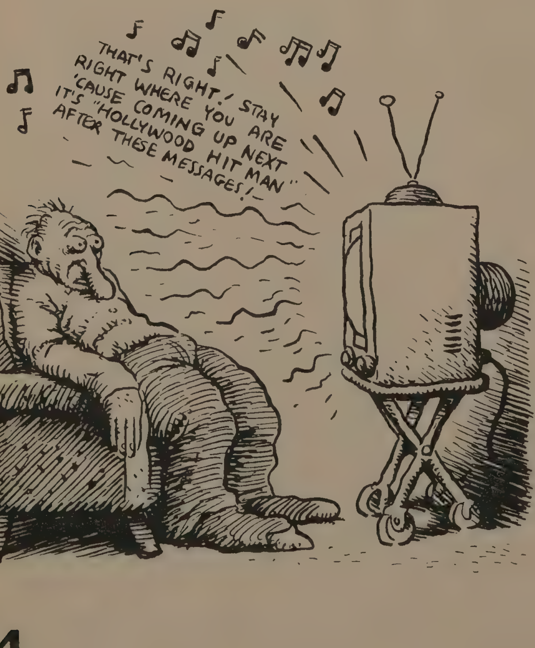
THAT'S RIGHT, STAY RIGHT WHERE YOU ARE 'CAUSE COMING UP NEXT IT'S 'HOLLYWOOD HIT MAN' AFTER THESE MESSAGES!

I asked Peper if he agreed with Krugman that reading was a more active learning process. "Definitely," he said. "Reading produces a much higher amount of beta activity. You would expect abnormality in anyone who produces alpha while reading. The horror of television," he added, "is that the information goes in, but we don't react to it. It goes right into our memory pool and perhaps we react to it later but we don't know what we're reacting to. When you watch television you are training yourself not to react and so later on, you're doing things without knowing why you're doing them or where they came from."

* * *

All Television Is Real

(From Argument Three, Chapter 12)

Seeing is believing.

Like many an axiom, this one is literally true. Only since the ascendancy of the media has this been opened to question.

Throughout the hundreds of thousands of generations of human existence, whatever we saw with our eyes was concrete and reliable. Experience was directly between us and the natural environment. Nonmediated. Nonprocessed. Not altered by other humans.

If we saw a flock of birds flying southward, then these birds were definitely doing that. We could believe in it. We might interpret this concrete information in various ways, perhaps misinterpret it, but there could never have been a question as to whether it was happening. The information itself, the birds and their flight, could not be doubted.

WHEN THE EYES ARE NOT MOVING, STARING ZOMBIELIKE, THINKING IS DIMINISHED.

This is the case with all sensory information. Whatever information the senses produce the brain trusts as *inherently* believable. If the senses could not be relied upon, then the world would have been an utterly confusing place. Humans would have been unable to make any sensible choices leading to survival. If there were no concretely true information, there could have been no sane functioning; the species could not have survived. This belief in sense perception is the foundation, the given, for human functioning.

...TELEVISION INFORMATION ENTERS UNFILTERED AND WHOLE, DIRECTLY INTO THE MEMORY BANKS, BUT IT IS NOT AVAILABLE FOR CONSCIOUS ANALYSIS, UNDERSTANDING OR LEARNING. IT IS SLEEP TEACHING.

In the modern world, information from the senses cannot be relied upon as before. We attempt to process artificial smells, tastes, sights and sounds as though they could reveal planetary reality, but we cannot make anything of them because we are no longer dealing directly with the planet. Within our cities the environment itself has been reconstructed into an already abstracted, arbitrary form. Our senses are no longer reacting to information that comes directly from the source. They are reacting to concrete, machines, buildings, processed information, the manifestation of human minds. Our information is confined in advance to the forms that other humans provide.

EVERYTHING THAT WE HUMANS CAN ACTUALLY DO ANYTHING ABOUT MOVES SLOWLY ENOUGH FOR US TO SEE.

Now, with electronic media, our senses are removed a step further from the source. The very images that we see can be altered and are. They are framed, ripped out of context, edited, re-created, sped up, slowed down and interrupted by other images. They arrive from a variety of places on the planet where we are not and were filmed at times which are not the present. What's more, many of the images are totally fictional. The things that we see are not happening and never happened. That is, they happened, but it is only the acting that happened, not the event.

Obviously, in the present age, we ought not rely on images to the same degree that our ancestors relied on the image of flying birds.

Meanwhile, the images proceed inward as though they were the same as natural, unprocessed imagery. They move, walk, talk, and seem real. We assume they are real in exactly the same way images have always been real. We are unaware of any alteration. The change is difficult to absorb.

What is required is a doubting process, a sensory cynicism that would have been profoundly inappropriate, even dangerous, for all previous human history. To assume that some sensory data could be eliminated totally and other sense information made unreliable would have left humans totally confused, lost in space, without knowledge of how to do anything, as though the sensory environment itself had somehow gone mad (*Solaris*). The synapse would be broken. Contact lost. That is the present situation.

We are only the second generation that has had to face the fact that huge proportions of the images we carry in our heads are not natural images which arrived as though they were connected to the planet. Like the Eskimo transplanted to the city, or the Indian from the jungle who must suddenly deal with metallic birds, we do not have the ability to cope. Evolution has not arranged for us to allow for varying degrees of absorption and reliance on visual and aural information. There is nothing in the history of the species which aids our basic senses in understanding that imagery can be altered in time, speed or sequence, or that an image can arrive from a distance. Without training in sensory cynicism, we cannot possibly learn to deal with this. It will take generations to let go of our genetically coded tendency to soak up all images as though they are 100 percent real. And think if we do manage to do that, what will we have? Creatures who cannot believe in their senses and who take everything as it comes, since nothing can be directly experienced (*1984*).

Without the human bias toward belief, the media could not exist. What's more, because the bias is so automatic and unnoticed, the media, *all* media, are in a position to exploit the belief, to encourage you to believe in their questionable sensory information. This bias to believe has commercial value for the media since it allows them to keep your attention as though it were south-flying birds you were seeing. The media, all media but particularly moving-image media, which present data so nearly natural, effectively convert our naive and automatic trust in the reliability of images into their own authority.

As I write these lines, my son Kai is seven years old. He still asks me if the Bionic Man, a definitely fictional character in a fictional story, is real or not. I remind him that the week before, he asked me the same question and I told him that the Bionic Man was not real, that he is an actor, that the story is made up, and so on.

"Isn't that a person on the screen?" he asks.

"Well, yes, but he leaps around, throws cars, and so on; humans can't do that."

"But couldn't somebody do that? Couldn't they invent something so people could do that?"

The line of inquiry goes like that. He asks me questions about other programs as well.

"Are the quiz shows real?"

"Yes."

[more →]

"Are they happening now?"

"No."

"When did they happen?"

"I don't know, maybe a week ago."

"Do they really win those prizes?"

"Yes, I think so."

"Is Kotter real? Is that a real school?"

"No, Kotter is an actor. The kids are actors."

"You mean those kids don't go to that school?"

"There is no school. That's television. That's a studio."

"What's a studio?"

"It's a place where they make up scenes to look like they're real, but they're not really real. They're all playing parts."

There are loose ends in my explanations because these are images of real people on the screen, and they are often doing logical, amusing and interesting things. It is difficult to get at exactly what I'm talking about. After all, there it is. Those are real people. It's happening. It *is* real. When Kai is watching television, he is watching people doing things, and they *are* doing them. It is the same as the south-flying birds. He is right. The things that he sees are real. It's just that they are made-up real. That is what I am trying to tell him. And *that* is pretty subtle.

The question of what is real and unreal is itself a new one, abstract and impossible to understand. The natural evolutionary design is for humans to see *all* things as real, since the things that we see have always been real. *Seeing things on television as false and unreal is learned.* It goes against nature. But how is a child to understand that? When the child is watching a television program, he or she has no innate ability to make any distinction between real and not-real. Once an image is inside the box and then inside the child's mind, having never existed in any concrete form, there is no operable distinction. All such images are equally real and the child is correct to see it that way. Only after the image is ingested can it be noted as unreal, and by then it's too late. It doesn't work. The images are already stored in the brain, with all the other images. Whatever I as parent can say about the images being in a separate category called "unreal" has only superficial meaning. Images are images. They run through Kai's dreams the same way whether they're real or not. They occupy his mind, whether real or not. The Bionic Man's movements, his way of speaking, his attitudes, his way of relating to people, are in Kai's mind no matter what I tell him about reality and unreality.

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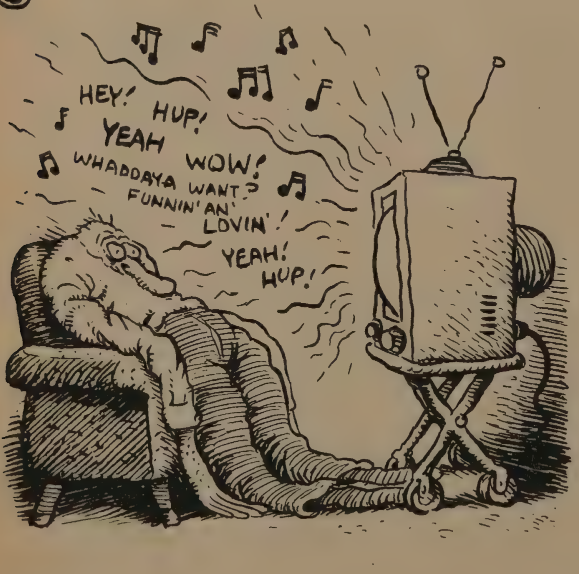
HEY!
HUP!
YEAH
WOW!
WHADDAYA WANT?
FUNNIN' AN' LOVIN'!
YEAH!
HUP!

THE LONGER THE SET IS ON, THE SLOWER THE BRAINWAVE ACTIVITY.

By now, Kai has learned that although he still has questions on all this, he'd better not ask too many of them. Even parents get annoyed with them, and other adults may actually laugh. Slowly, as he gets older, he is becoming educated. He finally knows how to discern what adults in our modern world mean by real and not real and can remind himself of that as he watches. He is learning to repress millions of years of genetic programming to accept all images as real, and to interfere with his own instincts, substituting interpretation. In this way he becomes more adult, which is to say, alienated from himself. He learns, as we all have, that images from television cannot be relied upon automatically as true and believable and that they have to be evaluated in some way: separated, categorized, dealt with differently from other images. He is developing sensory cynicism.

He does this, as we all do, by placing his intellect above his senses, as a kind of judge, reporter, observer upon his own experience. He says to himself, "This is real to me but I have learned that there are things in this world which are not real, even though they look perfectly real; many of these things are on television. Somebody wrote this program and those are actors playing the parts so it isn't real, so I don't believe it."

But he does believe it.

Of course you and I can tell the difference between real and not real on television. Correct? Well, friend, maybe *we* can, but there is sure as hell a lot of evidence that everyone else is pretty confused.

Now, this is an area that *has* been studied. There have been hundreds of reports showing that adults are having only a slightly less-hard time than children separating what is television from what is life.

Volume IV of Television and Social Behavior, prepared by the National Institute of Mental Health for the

Department of Health, Education and Welfare, reports that a majority of adults, nearly as high a percentage as children, use television to learn how to handle specific life problems: family routines; relationships with fellow workers; hierarchical values; how to deal with rebellious children; how to understand deviations from the social norm, sexually, politically, socially and interpersonally. The overall fare of television situation-comedies and dramatic programs is taken as valid, useful, informative, and, in the words of the report, "true to life."

Most viewers of television programming give the programming concrete validity, as though it were not fictional. When solving subsequent, similar problems in their own families, people report recalling how the problem was solved in a television version of that situation. They often make similar choices.

The report states:

". . . practical knowledge and methods of problem-solving lead the list of knowledge reported acquired through these programs. Furthermore, these dramatic programs are most often seen as realistic. . . . Many viewers then seem to be seeing the shows they value as directly relevant to their own lives . . . [they] evidently take the fictionalized content of dramatic programs more seriously and literally than most social thinkers and behavioral scientists have recognized."

In a society like ours, in which people have become increasingly isolated from each other in their offices, private cars, single-family living units and television-watching, sharing personal information has become a rarity. The extended family is gone and neighborhood community gatherings are increasingly the exception to the rule. There is less and less interpersonal sharing of intimate problems, few windows into other people's lives. Now our only windows are professional counselors, psychiatrists, and, least expensive and most available, television. It becomes the window for most people. That it looks into fictional lives is irrelevant.

Reports similar to the HEW report have been published many times. Recently, Dr. George Gerbner, dean of the Annenberg School of Communications at the University of Pennsylvania, and Dr. Larry Gross of the same institution completed a study for the National Institute of Mental Health. They found that "Although critics complain about the stereotyped characters and plots of TV dramas, many viewers look on them as representatives of the real world. Anyone who questions that assertion should read the 250,000 letters, most containing requests for medical advice, sent by viewers to 'Marcus Welby, M.D.' during the first five years of his practice on television."

"Imagine a hermit," they suggest, "who lives in a cave linked to the outside world by a television set that functions only during prime time. His knowledge of the world would be built exclusively out of the images and facts he could glean from the fictional events, persons, objects and places that appear on television. His expectations and judgments about the ways of the world would follow the conventions of TV programs with their predictable plots and outcomes. His views of human nature would be shaped by the shallow psychology of TV characters."

Gerbner and Gross found definite distortion of reality in three areas that they measured:

Heavy viewers of television were more likely to overestimate the percentage of the world population that lives in America; they seriously overestimated the percentage of the population who have professional jobs; and they drastically overestimated the number of police in the U.S. and the amount of violence. In all these cases, the overestimate matched a distortion that exists in television programming. The more television people watched, the more their view of the world matched television reality.

Knowledge that the television programs were fictional – surely no one who watches them can *consciously* doubt that police dramas are fiction – does not prevent one from "believing" them anyway, or at least gaining important impressions which lead to beliefs.

If you need further proof of this, there is always advertising.

A recent study showed that a greater percentage of voters based their decisions concerning candidates and ballot propositions on information received from advertising than on information received in any other way. This may be partially due to the fact that, except for big electoral races which are widely reported in all news media, we are likely to receive a greater *quantity* of data from advertising than from news. This is certainly true of most congressional races, and is even more true of local assembly races and ballot issues.

Yet we all know that advertising cannot be considered truthful. In fact, it is by nature one-sided. Advertising always reflects only the facts and opinions of the people who pay for it. Why else would they pay for it? And yet, knowing that, people use advertising information as though it can be relied upon.

ASIDE FROM THE VENALITY OF ITS CONTROLLERS, THE TECHNOLOGY OF TELEVISION DEFINES THE BOUNDARIES OF ITS CONTENT.

The situation is clearer still when it comes to product advertising. When you are watching an advertisement, you know for sure that the advertiser is trying to get you to do something: buy the product. You also know that the people in the ad are not "real," that is, they are actors who are speaking lines, in situations that do not represent their actual lives. Everyone knows this. We all know that the motive of the sponsors and the actors and the writers of the ads is that they are all trying to implant a feeling in us that will eventually get us to buy something.

[more →]

We know they are doing this but we very often act on the ad. Advertising works. Advertisers don't care at all if you know the advertising is fictional. They make very little effort to fool you about that. This is because whether you know it is fictional, the image of the product goes into your head. From then on, you've got the image and there's no letting it go.

Our thinking processes can't save us. To the degree that we are thinking as we watch television, a minute degree at most, the images pass right through anyway. They enter our brains. They remain permanently. We cannot tell, for sure, which images are ours and which came from distant places. Imagination and reality have merged. We have lost control of our images. We have lost control of our minds.

* * *

The following excerpts are from Argument Four, which has the title The Inherent Biases of Television. The author lists and explains some 40-odd biases inherent to television technology, included among which are the bias against the excluded material, the bias against subtlety, the bias against smallness, the bias away from sensory data, the bias to technique rather than content, the bias to speed and action, the bias against accuracy, the bias against truth, the bias toward the peaks of content and away from the troughs, as well as such prejudicial effects as separation from time and place, and the condensation of time. The excerpts we have chosen are from the sections on subtlety, sensory data, and the elimination of "aura."

Inherent Biases of Television

The kind of people who control television is certainly a problem. But this is only the beginning. While our field of knowledge is constrained by their venality and arrogance, the people who run television are constrained by the instrument itself.

Television is no open window through which all perception may pass. Quite the opposite. There are many technological factors that conspire to limit what the medium can transmit. Some information fits and some doesn't. Some information can pass through, but only after being reshaped, redefined, packaged, and made duller and coarser than before. Some ways of mind can be conveyed and some cannot.

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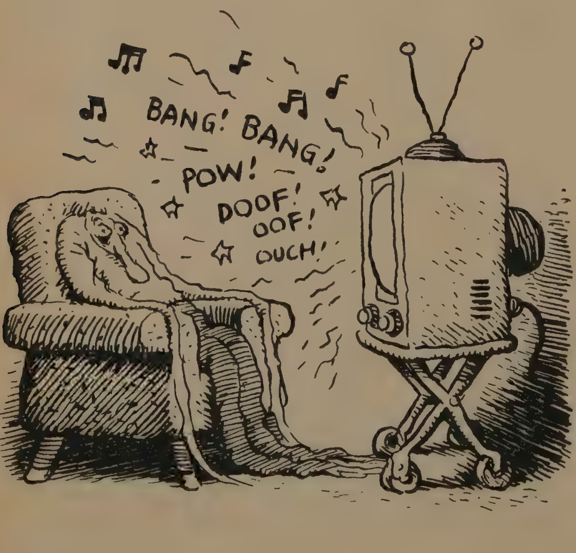
BANG! BANG!
POW!
DOOF! OOF!
OUCH!

The wrinkle in the story is that what *can* be conveyed through television are the ways of thinking and the kinds of information that suit the people who are in control. This is why they like it so much. It is obviously efficient for them to concentrate their communications within a medium that is good at conveying their forms of mind, just as a person with a drive for power is more apt to express that in politics than in gardening. Conversely, it is logical that the medium will not respond well to people or attitudes that defy its limits. It will throw them off, or distort their messages, as a computer would shun anyone who wishes to use it to express feelings of loving tenderness. It might program such a message, but only the words will come out on the tape; not the loving tenderness.

WHEN CHILDREN ARE WATCHING TELEVISION, THEY'RE BEING TRAINED NOT TO REACT.

So we have a chicken-egg problem. It's difficult to tell which came first, the technology or its controllers. It may not be that the corporate mentality won the war to control television. The technology itself picked its master, through the inexorable technological factors that confine its use.

* * *

The Bias Against Subtlety

As has been mentioned, the television screen produces its image by way of a grid of dots located along five hundred lines. This might seem to be sufficient for fairly detailed images, but it is not. Roughly speaking, the experience of looking at a TV picture is like looking at the world through a tea strainer. The picture is located along the grids. You fill in the blanks.

Compare the image of your television screen with any other image in your television room: the bookcase, the table, the rug. Obviously the actual object is vivid in comparison with the television image.

Television production people are exquisitely aware of this. There is an electronics term to describe it: "signal-to-noise ratio." Ordinarily applied to sound, the term can be applied to images as well.

The "signal" is the primary image that they are attempting to convey. The "noise" is the background, the fuzz, from which the signal has to stand out to be seen properly. A "clear" picture is one in which the signal and noise are well differentiated. In television, however, since the differentiation is difficult to achieve, program decisions and production styles have to be chosen to maximize what is possible. As a result, there is a tendency to concentrate on images which offer a large signal-to-noise distinction.

An enormous percentage of television images are close-ups of faces. This is not accidental. Faces in close-ups are about the sharpest signal that television can produce while still conveying content. Even so, if the background behind the face is complex, filled with varieties of objects and color tones, the face merges with the background and it all becomes a confusing jumble. So even while showing faces, television producers must keep the background "clean," stark, unencumbered. Dramatic programs are constructed so that there are very few adornments and props. This avoids a cluttered image and increases the potential for the primary image to communicate something.

In recent years there has emerged a very vocal group of outraged psychologists, educators and parents who speak of the urgent need to show positive behavior, such as loving, caring, sharing, and warmth, in television programs. They deplore the emphasis on "antisocial" behavior that is common on TV. Unfortunately these reformers are doomed to fail in their efforts because the medium is far better suited technically to expressing hate, fear, jealousy, winning, wanting and violence. They suffer very little information loss when pushed through the coarse imagery of television. Like other gross personal expressions — hysteria, or ebullience, or the kind of one-dimensional joyfulness usually associated with some objective victory — the facial expressions and bodily movements of antisocial behavior are highly visible. Hate, anger, competitiveness are obvious broad-band feelings with broad-band expressions. Most of them can be well communicated solely through body movement. No detail is needed to get the point, and neither is any special talent on the part of actor or director. They come through the filter of television with a minimum of information loss. The signal-to-noise ratio is relatively high.

MEDITATION MIGHT BE AN EXCELLENT ABILITY TO DEVELOP IN PEOPLE WHO ARE BOTHERED BY TELEVISION ADDICTION.

For these technical reasons, among others we will get to later, there is an emphasis on sports and violence in television programming, and there is great viewer interest in them.

The popularity of such programming is not so much a sign that public tastes are vulgar, as they are assumed to be in many quarters ("People want that kind of programming"), as it is a sign that these programs are the ones which manage to communicate *something*, at least, through television. Rather than illustrating the limits of the public mentality or taste, they illustrate the limits of the medium itself. The public wisely chooses programs which work best in a medium in which anything of a more subtle nature loses so much in translation as to be noncommunicative.

This is not to say that the businessmen who are the television powers that be aren't predisposed to further the values of competition and social Darwinism which *they* understand best and which are inherent in sports and violence programs. But no matter what their inclination, the fact exists that the kind of programming in which the least information is lost is the grosser forms: sports, violence, police action, as well as quiz shows, game shows, soap opera, situation comedy and news about murder, conflict, war, power politics and charismatic leaders. All of these categories of programming communicate on television because they deliver clear, easily grasped visual and auditory signals, together with broad-band emotional content, all of which make them highly efficient in a low-definition medium.

It always surprises me whenever any attempts are made to show wilderness or wildlife on television. The fuzzy image previously described is the first problem: forests become blurs, ocean depths are impossibly foggy, the details of plants are impossible to see. So the viewer depends on the voice-over to know what's going on. Because of the blur naturalist programs focus on such objective behavior as playing, fighting, mating, eating, just as they do with human sitcoms and soap operas. There are more animal programs than plant programs because animals come through better on the fuzzy medium, and the larger and more rambunctious the animal the better.

But even if TV images were not as coarse as I have described them, there would still be no way to understand a forest or swamp or desert without all the senses fully operative, receiving information in all ranges, and freely interacting with each other.

You *can* get some understanding from flora and fauna charts and from studying books on the habits of various species, but these are not enough. The logic and meaning of nature can be understood only through the senses. And only in the direct experience can real feeling develop; *caring*.

Any attempt to instill a caring about natural environments or their destruction that is confined to TV cannot succeed. Most of the message is lost in translation. Most of the key information is not communicable.

And yet, not knowing that anything is lost, the viewer assumes he or she is learning information that is valid, useful, and total. In that lies the most extreme danger, because slowly, caring is *reduced* and opposition to destruction is stifled. The more the natural environment is conveyed on television, the more likely its destruction becomes. Ecologists would be wise to abandon all attempts to put nature on television.

And so it goes in all areas. The religions of the world from Tibetan Buddhism to many forms of Catholicism are deeply rooted in the rich interplay of the human mind and senses. On television they must be understood through fixed cerebral channels, leaving description, but no feeling. The same can be said for most cultures of the world, still immersed in the sensory relationships between human and environment. There is no way to effectively convey African cultures, for example, through images disconnected from the other senses, and certainly not through logical analysis. More often than not these cultures and others are sensually or mystically based and can be deeply understood only in those terms. Unfortunately, television makes the effort to explain them anyway, just as it claims to convey nature, the arts, the news and the details of human feeling.

Human beings who view these attempts are led to believe that these fuzzy little pellets of information about our rich, subtle, complex and varied world constitute something close to reality. What they really do is make the world as fuzzy, coarse, and turned-off as the medium itself.

* * *

The Bias Against Life

In his novel Being There, Polish writer Jerzy Kosinski describes a man who is born and raised in a house that he never leaves. His only contacts with humans are occasional encounters with a half-crazy maid, a crippled, senile old man confined in a room upstairs, and a television set. He watches television constantly.

In middle age the hero is suddenly thrown out of the house into the city. Attempting to deal with a world which he has seen only as reproduced on television, he tries to apply what he has learned from the set. He adopts television behavior. He tries to imitate the behavior of the people he has seen on the screen. He speaks like them, moves as they do, imitates their facial expressions. However, because these people were only images to him, and he has never experienced *real* people, save for the crazies in his house, he does not know anything beyond the images. He does not know about feelings, for example. He adopts the movements of the images but can't connect this with anything deeper inside himself. Because he has not exchanged feeling with a live human, his ability to feel has atrophied. He is a mechanical person, a humanoid. He is there physically, but like the television images, he is also not there.

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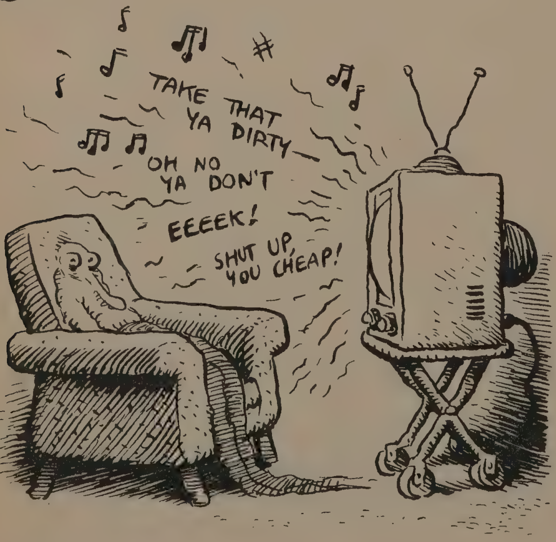
TAKE THAT YA DIRTY
OH NO YA DON'T
EEEEK!
SHUT UP, YOU CHEAP!

I wonder if you would be willing to try another little experiment. Please go look into a mirror. As you gaze at yourself, try to get a sense of what is lost between the mirror image of you, and *you*.

You might ask someone to join you facing the mirror. If so, you will surely feel that other person's presence as you stand there. But in the reflection, this feeling will be lost. You will be left with only the image, possibly an expressive one, but only an image. What is missing from the reflection is life, or essence.

...A GROWING INCIDENCE OF TELEVISION EPILEPSY AMONG THOSE PARTICULARLY SENSITIVE TO FLICKER...

Finally, place an object in front of the mirror: a hair dryer, a chair, a vacuum cleaner, a comb. What is lost? I won't say nothing is lost in the reflection, a mirror image does slightly alter the dimension and the color of an object. But life has not dropped out, because the object did not have any life in it. Nothing emanates from it.

More information is lost in the reflection of a living thing than of an object. In the living creature, there is something which can be experienced only in person, no matter how vivid the attempt at visual reproduction. The inanimate object, on the other hand, has only its form. This can be reflected, if not perfectly, at least very well in the mirror image.

What applies to a mirror applies even more to a photograph or a film, and still more to a television reproduction.

Because television cannot convey the essence of life, it makes sense for television producers to concentrate on information in which life essence is not required for the message to be communicated. You don't need to "feel" the essence of a football player or a bomber pilot or a police attack squad to follow the action. And you surely don't need to feel the life in the product that is advertised, since the product has no life to begin with. And so football games, action dramas and product commercials, in which the image can carry the story, obtain a degree of communications efficiency that is not possible with humans, animals and plants.

Thirty years before McLuhan, a German critic, Walter Benjamin, wrote what is still the classic essay on the way the media affects what it attempts to convey: "The Work of Art in the Age of Mechanical Reproduction" (reprinted in *Illuminations*, a collection of his essays).

Benjamin's central argument is that *all* technical reproduction of art, nature, and the human image deletes what he calls "aura." (At the time he wrote, photographic reproduction, including film, was the main topic under discussion. But the argument applies to television as well.)

"One might subsume the eliminated element in the term 'aura' and go on to say: that which withers in the age of mechanical reproduction is the aura of the work of art."

Benjamin reminds us that before the age of mechanical reproduction, art objects did not exist in a context outside of their original use. If a religious object were carved in bronze, this piece of bronze gained its meaning from its context, that is, the place and time of its use. When it is dug up by archeologists two thousand years later, it may have intellectual meaning and be informative or beautiful, but it will not have retained the quality of its original power. This depended upon its connection to time and place. When it is then put behind glass in a museum, it has still less power. When it is photographed and reproduced ten thousand times on postcards, although it can then be found in ten thousand homes, it is so many times removed from its original shell that it conveys nothing. At this point, it could be used by anyone for any purpose, including advertisement. Meaning must be invested into it, as it no longer has any of its own.

Benjamin notes that what is true for art objects is even more true for natural, living beings. The art object, once separated from its source in time and place, loses the powers invested in it. The human being loses humanness itself.

Benjamin describes the plight of the performer in a film, for example, who has the job of conveying him or herself through machinery which is predisposed not to allow such a conveyance.

"This situation might be characterized as follows: for the first time — and this is the effect of the film — man [the actor] has to operate with his whole living person, yet foregoing [his] aura. For aura is tied to his presence; there can be no replica of it.

THE EFFECT IS TO CREATE HARD-EDGED, NARROW MINDS.

"The feeling of strangeness that overcomes the actor before the camera . . . is basically of the same kind as the estrangement felt before one's image in the mirror. But now [with photography and film] the reflected image has become separable, transportable. . . . The film responds to the shriveling of the aura with an artificial build-up of the 'personality' outside the studio. The cult of the movie star, fostered by the money of the film industry, preserves not the unique aura of the person but the 'spell of the personality,' the phony spell of a commodity."

Mechanical reproduction is the great equalizer. When you reproduce any image of anything that formerly had aura (or life), the effect is to dislocate the image from the aura, leaving only the image. At this point, the image is neutral, it has no greater inherent power than commodities.

Products have no life to begin with, neither did they have any aura that attached to some original artistic or religious use at a certain place or time. There is no original car or vacuum cleaner, at least not among those that are advertised. They are all duplications of each other, like the fiftieth copy of a photograph. So products lose virtually nothing when their images are reproduced mechanically or electronically, while original art objects lose their contextual meaning, and human beings and other living creatures lose virtually everything that qualifies as meaningful. Humans become image shells, containing nothing inside, no better or worse, more or less meaningful than the product images that interrupt them every few minutes.

By the simple process of removing images from immediate experience and passing them instead through a machine, human beings lose one of the attributes that differentiate us from objects. Products, meanwhile, suffer no such loss and effectively obtain a kind of equality with these aura-amputated living creatures shown on television. These factors conspire to make television an inherently more efficient and effective medium for advertising than for conveying any information in which life force exists: human feeling, human interaction, natural environment, or ways of thinking and being.

Advertisers, however, are not satisfied with equality. Leaving their products in their natural deadness would not instill any desire to buy. And so the advertising person goes a step further by constructing drama around the product, investing it with an *apparent* life. Since a product has no inherent drama, techniques are used to dramatize and enliven the product. Cuts, edits, zooms, cartoons and other effects have the effect of adding an artificial life force to the product. These technical events make it possible for products to surpass in power the images of the creatures whose aura has been separated from them by the act of mechanical or electronic reproduction.

So television accomplishes something that in real life would be impossible: making products more "alive" than people.

Walter Benjamin draws important political and psychological conclusions from the disconnection of humans and art from their auras.

He argues that in destroying aura via the mechanical reproduction of art, all art as well as humans and nature lose their grounding, their meaning in time and place. At this point, like the product in the advertisement, the art image or the human image can be used for any purpose whatsoever. The disconnection from inherent meaning, which would be visible if image, object and context were still merged, leads to a similarly disconnected aesthetics in which all uses for images are equal. All meaning in art and also human acts is invested. There is no inherent meaning in anything. Everything, even war, becomes art, and we are back to Werner Erhard, *Solaris* and *1984*.

[more→]

To illustrate the problem, Benjamin quotes Filippo Marinetti, one of the founders of Italian Futurism:

" 'For twenty-seven years we Futurists have rebelled against the branding of war as antiaesthetic. . . . Accordingly we state . . . War is beautiful because it establishes man's dominion over the subjugated machinery by means of gas masks, terrifying megaphones, flame throwers, and small tanks. War is beautiful because it initiates the dreamt-of metalization of the human body. War is beautiful because it enriches a flowering meadow with the fiery orchids of machine guns. War is beautiful because it combines the gunfire, the cannonades, the cease-fire, the scents, and the stench of putrefaction into a symphony. War is beautiful because it creates new architecture, like that of the big tanks, the geometrical formation flights, the smoke spirals from burning villages, and many others. . . . Poets and artists of Futurism . . . remember these principles of an aesthetics of war so that your struggle for a new literature and a new graphic art . . . may be illumined by them.' "

Benjamin says this loss of the inherent meaning which is connected to art, humans and nature furthers the notion that all experience is equal, leading in short steps to Fascism: "[Fascism] expects war to supply the artistic gratification of a sense perception that has been changed by technology. This is evidently the consummation of 'l'art pour l'art.' Mankind, which in Homer's time was an object for contemplation of the Olympian gods, now is one for itself. Its self-alienation has reached such a degree that it can experience its own destruction as an aesthetic pleasure of the first order."

Ronald Reagan once said, "If you've seen one redwood, you've seen them all." A movie actor and politician, Reagan had doubtless struggled with the question of the reproducibility of himself. Perhaps he, like other commodities, lost his essence in reproduction and so did not notice that all redwoods are *not* the same.

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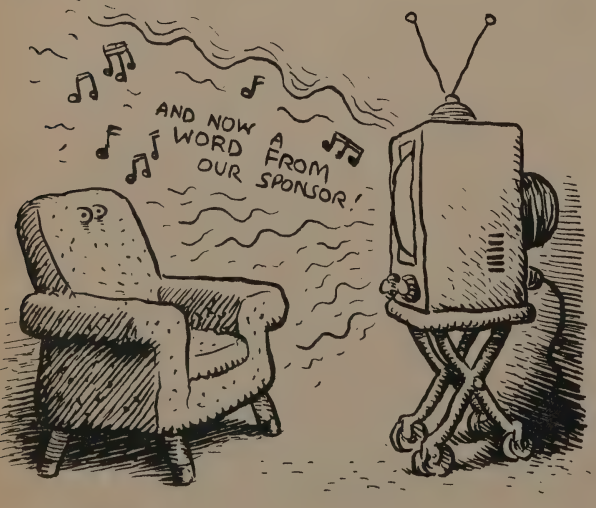

AND NOW A WORD FROM OUR SPONSOR!
??

At the time of his remark, I was working with the Sierra Club on the campaign to keep some of the virgin redwoods, many of which had been growing since before the time of Christ, from being cut down by logging companies. Everyone thought the Reagan statement typical of the problem. A great many human beings could not understand that there is a difference between the original, old-growth trees and the replanted redwoods the companies would exhibit on their tree farms.

Not caring about the old trees, the lumber companies could put out pamphlets that discussed the trees in cosmetic terms. One horrible example was their argument that "all most people really want is for the trees along the highway to be saved, so they can stop their cars, and pose for snapshots next to a redwood."

The lumber companies may have been more right than wrong. Removed from direct contact with the old trees, their aura, their power, their life, their message about the potentialities of the planet, many people may have found Reagan's statement and the lumber company position plausible.

To offset this, we worked to convey a sense of what was being lost. We attempted to do this through the media. We carried around photos of the great old groves: moody, magical, somber, awesome, and attempted to place them in newspapers, magazines and on television.

Some outlets carried them and some did not, but it was clear that it didn't really matter whether they were reproduced in the media. They didn't "work." Too much was lost in the translation. More than anything, they lost their "aura," the mood that surrounds them and the quality of their existence that can be captured only in their presence.

Then we started doing the opposite. We carried around photos of acres of stumps where hundreds of redwoods had been cut down. I don't know if you have ever seen a field of tree stumps, but it is a horrific sight, not unlike a battlefield. Fortunately, however, it has very high visual definition, conveys a broadband emotion — horror — and does not have the problem of conveying aura, since everything is dead.

When we carried these latter photos around, the media grabbed them. They even dispatched their own crews to redwood country to expand on what we'd brought.

That is the moment I learned that death is a much better subject for television than life. And so when television decided to concentrate upon images of dead bodies in Vietnam, it came as no surprise to me.

In the cases of both redwoods and Vietnam, images of death finally aroused the public. Images of life — whether the trees themselves, or the finely tuned Vietnamese culture and sensibility — accomplished nothing. They were far too complex, too subtle. They involved too many senses. Most of all, they required a conveyance of aura. Since none of this was possible on television, they only put people to sleep. ■

Hypnotic Age Regression of a Television Addict

by Paul Krassner

Illustrated by Gilbert Shelton

Recently there was an intriguing little news item about a Palo Alto mother who had shot her television set. She was arrested for disturbing the peace. The judge gave her a suspended sentence on condition that she undergo immediate psychotherapy.

A routine check of court records led to psychiatrist Thomas R. Burnhill who, together with colleagues at Stanford Research Institute, developed a technique of hypnotic age regression in conjunction with ketamine (an anesthetic which leaves a patient feeling "out of the body" but fully conscious).

This process enables one to verbalize sense-memories with unusual objectivity. Moreover, an individual can articulate even pre-speech childhood experiences.

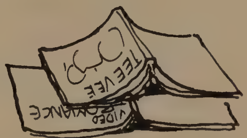
The subject in this case — a 27-year-old Caucasian female to be identified only as Nancy L.; she works as a graphic designer at home in order to take care of her infant daughter, Ariadne (pseudonym) — agreed that excerpts from the tapes of her sessions with Dr. Burnhill could be quoted in the present context.

After a preliminary meeting to establish rapport and determine Nancy's susceptibility to hypnotic induction, they entered into an exploration of her behavioral roots, beginning with the day of the incident itself.

> *. . . Now, as you approach your TV set for the first time today, tell me, what emotion do you feel?*
>
> Mixed. Mixed emotions. I feel annoyance, a slight annoyance.
>
> *At your television set?*
>
> No, at my clock-radio. It gets me up at seven o'clock in the morning. But I also feel anticipation. I like to watch the TV news in the morning. It puts my own problems in perspective. And I think David Hartman is kinda cute. But there's a touch of guilt I also feel.
>
> *Why? What makes you feel guilty?*
>
> Disloyalty to CBS. I used to watch *their* morning news. But now I watch ABC instead. They have Face-Off plus Jack Anderson plus Rona Barrett. Then, around five minutes before the hour, when they do the national weather report on *Good Morning, America*, then I switch to CBS just in time to catch Hughes Rudd and his final witty story. This is my morning religious ritual.
>
> *Is there anything in particular on the news this morning which stirs you emotionally?*
>
> Not really. It all just sort of goes by, like on a conveyor belt. Although . . . I do get a little bothered by their reminder to watch the CBS *Evening* News with Walter Cronkite. Every program is always telling you to be sure to watch all these *other* programs. If they had their way I would be watching TV all the *time*, except for when I'm supposed to be out buying the sponsor's products . . .

Indeed, a pair of TV-commercial-oriented encounters with herself would occur later that same morning. Here, Nancy L. is shopping at the local supermarket:

> . . . I'm in the aisle where they have kitchen supplies. And I notice this, what you might call a mini-adrenalin rush, just as I'm putting a box of Ajax into Ariadne's stroller. She reaches out as though it's a prize. And the exact instant I give it to her to hold, that's when I have this reaction. My heart gives a little thump.
>
> *What do you feel?*
>
> As though I am handing over something *evil* to her.
>
> *Why? Why does it feel evil?*
>
> Because of their commercial. The Ajax commercial is evil.



Tell me about it.

They show a housewife in the kitchen. She's worried because her in-laws are coming to dinner, and they might despise her because they can't see their faces shine in her dishes or something. Then this handyman or plumber magically appears in the kitchen. And he does her dishes with Ajax. And then he rubs his finger along the plate to show her how clean it is, and you hear this godawful *screech*! Like when you rub your fingernails on a blackboard. You get an actual *physical* reaction. I mean this commercial borders on sadism. And there I am *buying* a box of Ajax. I guess that makes me a masochist, huh? . . .

Afterward, she finds herself standing "slightly perplexed" in front of a McDonald's.

. . . *Can you pinpoint precisely what it is which perplexes you?*

Well, I'm trying to be a vegetarian. But I'm *so* tempted to have a Big Mac. It's like I'm *almost* not in control of myself. So I just stand there. I'm aware of a certain feeling of excitement.

Could this be due to a forbidden aspect of eating meat for you?

More than that. It's the commercial again. There is something evil about their commercial.

Describe it, please.

I can't. I mean it isn't the commercial itself, this has to do with the *placement* of the commercials. I associate McDonald's with the relief of tension. But the tension is not hunger. There's something else.

Tell me what you feel. Pluck it gently from your subconscious.

There is a connection between the excitement, the vicarious excitement that a crime show builds up to right before the commercial. And then the *commercial itself* relieves the tension. So now I am in front of McDonald's and I realize that I have been programmed with a sense of *adventure* about eating there. I feel like Pavlov's dog standing there with an invisible leash.

Do you go inside? Do you have a Big Mac?

Yes. But only because I already bought the box of Ajax. . . .

Dr. Burnhill proceeds to take Nancy L. through her viewing day. At three o'clock she watches the Dinah Shore show. From four to five-thirty she alternates between the Merv Griffin show and the Mike Douglas show.

. . . It's like going to a party every day with all these different show business personalities, without having to, you know, participate. And sometimes there's an interesting fact you learn. At least it's more intelligent than all that kaka-doodoo stuff they have, like on *The Newlywed Game* – that's really insulting – but I'll admit, I'm a TV junkie anyway.

You believe you are addicted to television?

Oh, for sure. I watch an average of nine hours a day. And it doesn't even give me *pleasure*. It's just a way of avoiding pain. Isn't that how you judge addiction?

What pain are you avoiding?

The pain of not watching. I *told* you I was hooked. After Merv Griffin and Mike Douglas I watch re-runs of the Mary Tyler Moore show on afternoon prime time. Or, if I remember an episode, I'll watch a Carol Burnett re-run instead. It's like my TV is always *on* something, and it constantly wants to get *me* on it too. Then comes the local news at six o'clock, then the CBS Evening News, then the NBC Evening News.

Why do you watch them both?

Well, my rationalization is that I like to compare their news. What they emphasize and stuff. One time, remember when that sleazo Henry Kissinger was touring China? And he was in Hong Kong?

> The CBS correspondent said he was visiting the Garden of Paradise. But the NBC correspondent showed him walking in the same place and *he* called it the Garden of Fools. Maybe the world is really being run by professional translators.
>
> *Why do you call Henry Kissinger a sleazo?*
>
> Well, because he *is* a sleazo. He's a war criminal. I mean that's what is so — well, schizophrenic — about my TV set. One day John Chancellor tells me that the former CIA Director, what's-his-name, Richard Helms, threatened to implicate Henry Kissinger in the whole Chilean *coup* if he went to prison, to bring Kissinger down with him, and then another day David Brinkley sits down and has a civilized *chat* with El Sleazo, because good ol' Henry happens to be a *special advisor* to NBC news. That's sick, it really is. . . .

On this particular evening, Nancy has not accepted a dinner invitation because there is a Richard Pryor special on television.

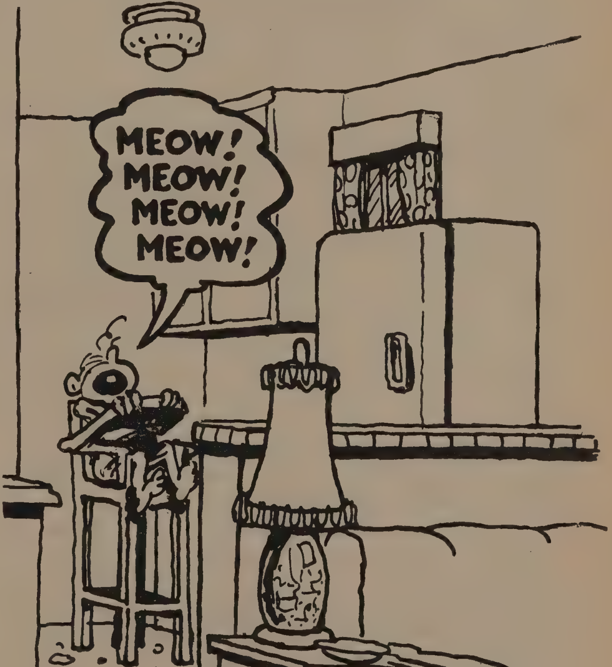
> . . . I can see these friends any time, but if I miss Richard Pryor, that's it. I felt bad when I missed the Lily Tomlin special. That was one time only, too. It's creative obsolescence. Plus, your TV set forces you to be right there at a specific time on a specific day.
>
> *Do you resent this?*
>
> I adapt to it. I talk to my TV set. I tell Richard Pryor, "Massa, I am your slave. I am at your beck and call. No matter how excellent your program may be, this is still slavery. Voluntary slavery . . ."

Later that evening, Nancy watches the Dick Cavett show. He is interviewing actress Louise Lasser.

> . . . I used to watch *Mary Hartman, Mary Hartman* every night. So I have been looking forward to this interview. But I feel a certain restlessness while it is on. Gary (boyfriend) is supposed to call long-distance tonight. I find myself secretly hoping that the telephone won't ring while the TV is on. I feel as if I am psychically conspiring with the TV set against the telephone. Also, I am waiting for a commercial break so that I can get up and pee, but there are no commercials on PBS.
>
> *Do you get up to pee?*
>
> No. Not even when the interview gets boring. Instead, I switch to *Fernwood Forever.* Tom Hartman is saying how much he misses Mary. I say, out loud, "Turn on Dick Cavett and you'll find her." Then I ask myself, "What the hell are you *doing*? This is crazy!"
>
> *What is crazy?*
>
> I don't even enjoy the *company* of these assholes and I'm all involved with their non-existent problems. But when a commercial comes on *this* channel, *then* I get up and pee. . . .

Finally, Nancy watches the Johnny Carson show. It was during this program, shortly past midnight, when she shot her television set.

> . . . I am rolling a joint as Johnny is doing his opening monologue. And after a while, I just smoke a little weed and lay back and start playing with myself.
>
> *Do you masturbate to a climax?*
>
> Absolutely. I am still floating in this sweet post-orgasmic haze. Suddenly I hear a voice say, "Stay where you are." At first I think it's a burglar in my bedroom. Then I realize it's only Johnny Carson, concerned that I might go away during the commercials. And I suddenly understand. My TV set is *afraid* of me. It is even more insecure than it tries to make *me* be.
>
> *How does your TV set try to make you insecure?*
>
> It is constantly bombarding me with fears couched behind smiles. Fear that I don't have enough iron in my blood. Fear that my oven cleaner will fill my kitchen with deadly fumes. Fear of indigestion, fear of stinko breath, fear that my headache won't disappear fast enough. . . . The moment I realize that my TV set is really afraid of *me*, though, I start crying. Uncontrollably. It wakes the baby up. Ariadne says her first word when I go to pick her up. She says, "Meow-meow-meow-meow." We don't even have a cat. I'm horrified. She has gotten her first word from a TV commercial for cat food. I hug my baby. "Sweetie, you're a



human being, not a cat. Jesus, you can't even speak *English* yet. What are they *doing* to you?" And this is the instant. Very calmly I put her back in her crib. "Excuse me just a second." And I simply walk back to the bedroom to get my gun. Surprised at how centered I feel.

Now wait. Try to stretch out this moment, as if you are pulling taffy. What are your exact thoughts?

Rape. They are raping Ariadne's soul. Gary gave me a gun to protect us while he's on the road. To protect us from burglars and rapists. Well, this TV set is a burglar. It has been stealing my time. And it is an electronic rapist that I have *allowed* into my home.

What do you think as you go to the TV set with the gun in your hand?

This is self-defense.

Do you have any doubts over what you are about to do?

For a second I hesitate. I have an urge to check my copy of *TV Guide* to see who the guest is on the Tom Snyder show. Then I aim. I don't shoot yet. Paul Ehrlich is the guest. He says important stuff about ecology. Maybe I'm making a mistake. Then a commercial comes on. "Nestle's real chocolate morsels – my family's worth it!" And I pull the trigger. My TV set explodes.

What is your feeling at this moment?

Exhilaration. I have been boycotting all Nestle products because they keep selling infant formula to third-world mothers who don't have sterilizing equipment or refrigerators, and who could breast-feed their babies just the way I breast-feed Ariadne. Their babies keep dying. I have killed my TV set to avenge those murdered third-world babies. I have committed an act of political assassination. I have liberated myself from my TV set. I have protected my helpless daughter from this – stationary marauder. I have done the right thing. I am sobbing with pride. . . .

Dr. Burnhill remarked to this reporter that "Nancy L.'s relationship with her television set paralleled that of a subject toward a hypnotist." In order to test that hypothesis, he regressed her all the way back to her own infancy. Here is Nancy at the age of two:

. . . My parents are watching television. I am waiting for my favorite lady-in-the-box. Her name is Betty Furness.

Why is she your favorite?

I get a feeling of security from her. I like the friendly way she always opens the refrigerator door. I wish my mother was like her, smiling all the time and never yelling.

Nancy at the age of eighteen months:

. . . I am crawling into my parents' bedroom. They are wrestling like those men on TV they watch. But they don't want me to watch *them*. I get picked up and put into my playpen.

How does this make you feel?

Confused. Because they start wrestling again. I can tell because I can hear them grunting. But then the telephone rings. They stop grunting. I hear my father say "Hello." I feel he loves the telephone more than he loves me.

Nancy at the age of one year:

. . . I observe my parents in order to learn how I should behave as a human being. When the alarm clock buzzes, they wake up. When the toaster pops up bread, they go and fetch it. When the tea kettle wistles, they obey it immediately. When the doorbell rings, they go and answer it. When the TV gets sick, they bring in a doctor to examine it.

How do you feel when your TV gets sick?

I want it to get better. I miss looking at it. I like to watch the TV-people tell my parents to go get this and go get that, and then later they go out and get it.

Why do you like that?

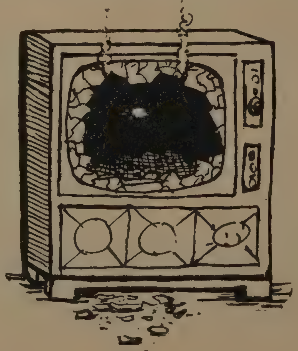
Because it's fun to learn. It just feels good.

What does your TV teach you?

The purpose of life is for machines to tell people what to do. . . .

Dr. Burnhill is preparing to expound on his theory of Video Hypnosis on the Phil Donahue show. "I realize the irony of discussing this on television," he states, "but actually it's a way of reaching a great many more people than, say, an article in a professional journal. I have a duty to warn the public about my findings. For example, the latest trend I have noted in my research – and I am truly grateful to Nancy L. for providing the impetus to this investigation into the nature of passivity – is the two-parter situation comedy. The viewer's attention remains, on some level of consciousness during the interim week, focused on an artificial crisis. So far I have logged this trend with *All in the Family, Good Times, Welcome Back Kotter, Maude, One Day at a Time, Busting Loose, Laverne and Shirley, Barney Miller, Eight is Enough, Rhoda and Happy Days. . . .*" ■

Paul Krassner is the once and future editor of The Realist, *and an original founder of the Yippies.*



Deprogramming the Media Mind

or Turn Off, Tune Out, and Drop On Over Some Time

BY SCOOP NISKER

Mental Floss

"The epitome of the human realm is to be stuck in a huge traffic jam of discursive thought."
— From The Myth of Freedom by Chogyam Trungpa

"There are many media, but I am The Medium. Not too hot and not too cold."
— The Swami from Miami

We are all wired. Caught together in a web of resonance. Joined to everyone else on the planet by cables, lines, signals and satellites. The air waves crackle with billions of invisible forms, realities that buzz across the sky. Centuries dissolve into an instant, civilizations crumble before the electronic onslaught. The world mind broadcasts through all of us. The Holy Image Empire programs the common reality. The revolutionaries are those who are severing themselves from the Imperial circuits.

* * *

NOTES OF A JINGLE JUNKIE

> *". . . breath . . . breath . . . 'let me take you down, cause I'm going soon' . . . back to the breath . . . breath . . . 'strawberry fields' . . . oh no, another damn song is playing . . . breath . . . breath . . . 'nothing is real' . . . it's a damn good song too . . . breath . . . 'nothing to get hung about' . . . why can't I stop these songs from playing through my meditation . . . breath . . . breath . . . 'strawberry fields forever' . . . break out of it . . . try counting 20 breaths in a row . . . breath . . . one . . . breath . . . two . . . breath . . . 'living is easy with eyes closed' . . . Oh yea . . . lots of luck, Maharishi. . . .*

In 1970 I spent six months in India studying Buddhist Vipassana Meditation with a jolly fat teacher named S. N. Goenka. It was during this practice that I discovered my true essence. I am a jukebox. My life is measured out in popular songs. "I got the music IN me . . .!"

This is how I found myself out. For the first few weeks of the meditation I spent eight hours a day trying to concentrate on my breath and found that I couldn't pay attention for more than 10 seconds at a time. What a shock to realize that I am not in control of my own thoughts! My God, I have no free will! I want to concentrate on my breath and my mind is . . ."thinkin' bout the government." My head is like a fully automated radio station and the program director is very reluctant to change the format. "And the hits just keep on comin. . . ."

After several months of struggle I finally gained enough mental control to step back out of the flow and begin to watch my own thought patterns. Actually I began to listen to myself think, a startling perspective. I became aware that all these prerecorded tapes are playing through my mind, continually broadcasting and rebroadcasting the shows of my life. Take my money show, for example, please. I watched it proceed several times through the following sequence of thoughts, with full musical accompaniment.

> *". . . How am I going to spend the $500 in my secret stash . . . I need to figure out a way to make a killing . . . maybe I should import saris to America . . . but I really don't care about money anyway . . . and I hate capitalism . . . wish I had enough money left to arrange a trip to China on my way home. . . ."*

I did not program this tape. This tape was programming me. All of these thoughts proceeded automatically, one impulse leading to the stream of ideas, feelings, verbiage. Some mental signal pushed the start button and my synapses just began to fire this show into consciousness like an electron gun. It wasn't "me" that was thinking. My thoughts were thinking themselves. My mind has a mind of its own.

It was during this first meditation retreat that I also became especially aware of how media programming works on me. I have always been hooked on popular music, and for two years before I went to India I worked at a rock-and-roll radio station. Therefore when I sat down to meditate I found that songs constantly played along in my head, fading in and out of awareness, while I was trying to concentrate on my breath. Here's a very real moment of one of my top 40 meditation sessions. Listen to my mind.

> *". . . breath . . . breath . . . breath . . . 'When I get off a this mountain, you know where I wanna go' . . . a song by the Band . . . it's a great song . . . 'to the Gulf of Mexico' . . . better get back to the breath . . . breath . . . breath . . . 'little Bessie girl I once knew' . . . ah yes, that song reminds me of a fall day in San Francisco . . . getting high . . . breath . . . breath . . . 'Up on Cripple Creek, she sends me' . . . oops . . . breath . . . I am really caught on that song . . . makes me forget to watch my breath . . . breath . . . did I judge that last thought negatively . . . breath . . . breath . . . gotta let go of those thoughts . . . and those judgments . . . and those songs . . . breath . . . breath . . . breath . . . 'a drunkards dream if I ever did see one' . . ."*

After several months of meditation a lot of my media tapes began to play themselves out. It happened automatically. The process of stepping outside of my thought tapes instead of rolling with them seemed to weaken their imprint. They weren't being so strongly rerecorded. By simply becoming a detached observer

of my mental processes I was beginning to deprogram myself. And as the media tapes became dimmer and dimmer I began to feel some times of great peace. And moments of beautiful clarity. I also was able to hear some other tapes that had been stored further back in my subconscious mind. Some new selections. As my head became emptier I was able to gain some control over the programming. I was beginning to take over my own internal radio station.

When I ended my meditation retreat and came back to America I got plugged in once again and immediately began to get reprogrammed with the all new top 40. I realized then that meditation is a constant process of erasing the tapes, and keeping the mind free. Since I had reentered the buzzing media environment of America with a relatively calm and empty head, I also became intensely aware of the enormous power of the media to affect my moods and my life. I knew then that a jingle junkie needs constant vigilance in order to remain free.

MEDITATION WITH THE TV ON
or
PLUGGING IN TO YOUR ELECTRIC CHAKRA

You are what you think, and what you think is your programming, your culture, your media. And just as you can begin to deprogram yourself by watching your own thoughts, you can also begin to deprogram yourself by watching the thoughts of your civilization as seen through its broadcast mind. Although strictly speaking you can't meditate with the TV on, the meditation principle of becoming a detached observer can be indirectly applied to media programming.

Following are a few techniques, some mental floss to help you prevent media particles from becoming caught between your synapses, causing cavities in your behavior. These are media games to play that will allow you to become a more detached observer, and as it were, to let the programming flow in one ear and out the other.

1. The Technical Events Test

In his book, *Four Arguments for The Elimination of TV*, (excerpted on p. 38, this issue), Jerry Mander suggests a way to watch TV that releases you from some of its influencing power. He proposes a technical events test which consists of turning on your TV and simply counting the number of technical events in any given program or advertisement. Technical events are things like scene changes, cuts, zooms, changes in camera angles, music intros, etc. Mander says, "As people become aware of the degree to which technique, rather than anything intrinsically interesting, keeps them fixed to the screen, withdrawal from addiction and immersion can begin." It's like becoming a detached observer from an editor's perspective. Automatically it weakens the imprinting power of the program. Instead of watching TV programming, you are now watching the programming of TV.

2. The Freud-Jung Approach

Another similar awareness technique involves watching for the symbolism in media broadcasts and how that symbolism is manipulated. What is THE PROGRAM behind the program? What roles, emotions, and ideals are being presented and how are they worked into the show? Look for the signs of the times, the cultural artifacts, the trends. What are the true American archetypes? Who are our heroes? Our shamans? Watch for the Freudian symbols in any given Kojak program. (His bald head?) What imagery does Clairol use to get us to buy the Herbal Essence? It's like stepping outside of history and becoming aware of the cultural conditioning of your entire society. You are now becoming a detached observer from a director's perspective. Instead of watching the TV programming, you are now watching the TV programming of you.

While you are looking for the broadcast media symbols, also try noticing how you are affected by them. Watch the watcher and listen to the listener. Try to become aware of your moods and energy as you tune in to the broadcasts. Does a certain popular song make you feel sentimental? Sexual? "Don't it make my brown eyes blue?" What emotions are aroused in you by a news story? "The Nuclear Regulatory Commission today announced plans to store high level radioactive wastes in . . ." What is your reaction to that financial security commercial? Are you planning for your retirement future? As you notice the techniques and symbols that are used to create reactions of fear, desire, tension, or happiness, check in to see how they are working on you. How much are you a creature of media programming?

As in meditation, it is not important or useful to make judgments about the things you observe because it is all too easy to become what you hate. The simple act of watching for the symbols and your reactions to them will begin to detach you from the imprinting power of the program itself.

(A Buddhist aside: I think the Truth in Advertising Council should ask the makers of Schlitz Beer to prove that you only go around once in life. A lot of people I know believe that you can and do take your gusto with you for the next round.)

3. The Intensive Media Journal Technique

If you are really serious about becoming aware of your media habits and how they affect you, keep a journal for a week or so. Make notes of the following items in your journal:

A. What media did I tune in to today? How long did I stay tuned in? (Newspapers and magazines count.)

B. What was the program (scene, image, dialogue, article, song) trying to say? What was being programmed?

C. How did that media hit make me feel? What did it do to my mood? My energy level?

Keep the journal for at least a week. When you are finished with it you could then send it in as your application to become a Nielsen family.

4. The Media Methadone Program

This awareness game is for hard core addicts and it simply involves switching to a different drug for a week. Try some different channels. If you are a rock and roll fiend try a week of only classical music or jazz. (No fusion or funk allowed.) What does it do to your drive-time mood? In what circumstances do you really want a fix of that hard 4/4 beat? If you are a news junkie try staying off all news for a week, even magazine features related to the news. As I tell my journalist friends, "You are what you cover," and ingesting news reality can be hazardous to your health. What is important in this game is to switch your media habit drastically for a week and become aware of how it affects you. Watch the watcher.

5. The Seven Day Media Fast

Cold turkey. Pull the plug. Postpone the subscription. Find out what else there is to do. Watch yourself become bored. Those of you who are unable to eat unless you are also reading or watching TV will have to go on a food fast as well. You'll also have to food fast if you can't sit on the toilet without a media hit. Depending on how much you are addicted, withdrawal will be very unpleasant, if not agonizing. You will have to watch yourself because there is nothing else on. Maybe you will find that you aren't as clever as Maude, but at least you will have had a chance to try some one liners of your own. And even if you return to your media habit after the seven day fast, you will have proven to yourself that you can quit anytime you want.

* * *

I hope you will have fun and learn a lot from these media awareness games. I can't promise perfect broadcast bliss or instant electronic enlightenment. Maybe you will simply find that participating in your media programming is more entertaining than just letting your media program you. Or perhaps you will have taken the first step on the path to freedom from the Holy Image Empire. As I always say at the end of my own radio broadcasts, "If you don't like the news, go out and make some of your own." ■

Three Forefathers

TEXT: LARRY LEE
ILLUSTRATIONS: JAY KINNEY

The machines of the broadcast area are too complex to allow certification of "inventors" in the simple old sense of the word that Eli Whitney or James Watt enjoyed.

Radio and television are systems, assemblages of separate little discoveries which, once put together, fulfilled needs which had been fed for many years before by fiction and by speculative reporting. RCA officials noticed during the thirties that radio sales fell off every time popular magazines ran a flurry of articles on television. The deeply-felt desire for these machines existed for many years before the patent applications arrived in Washington, D.C.

The way in which the history of broadcasting has been told is a little lesson in how the capitalist process defines our world. We know, for example, that Guglielmo Marconi invented the radio, but if he were the only inventor, our appreciation of that medium would be restricted to applause for *rubato* on the code-key. He certainly didn't invent the kind of radio you listen to in your car or the FM tuner you have at home. At World's Fairs since 1939, RCA has labored to convince us that Vladimir Zworykin invented television, but he invented television almost exactly like Don Ameche invented the telephone.

In these three sketches on the secret forefathers of broadcast, and in the long article on Nikola Tesla which follows, it becomes obvious that inventors labor under a dark cloud of predestination which precludes happy endings. (Notice the number of laboratory fires.) Their place in the larger scheme of things is roughly equivalent to the nameless stoop laborers the De Beers guards pat down as they exit the diamond mine. Find the Hope Diamond and you may get the weekend off, but it's tough to get a piece of the action.

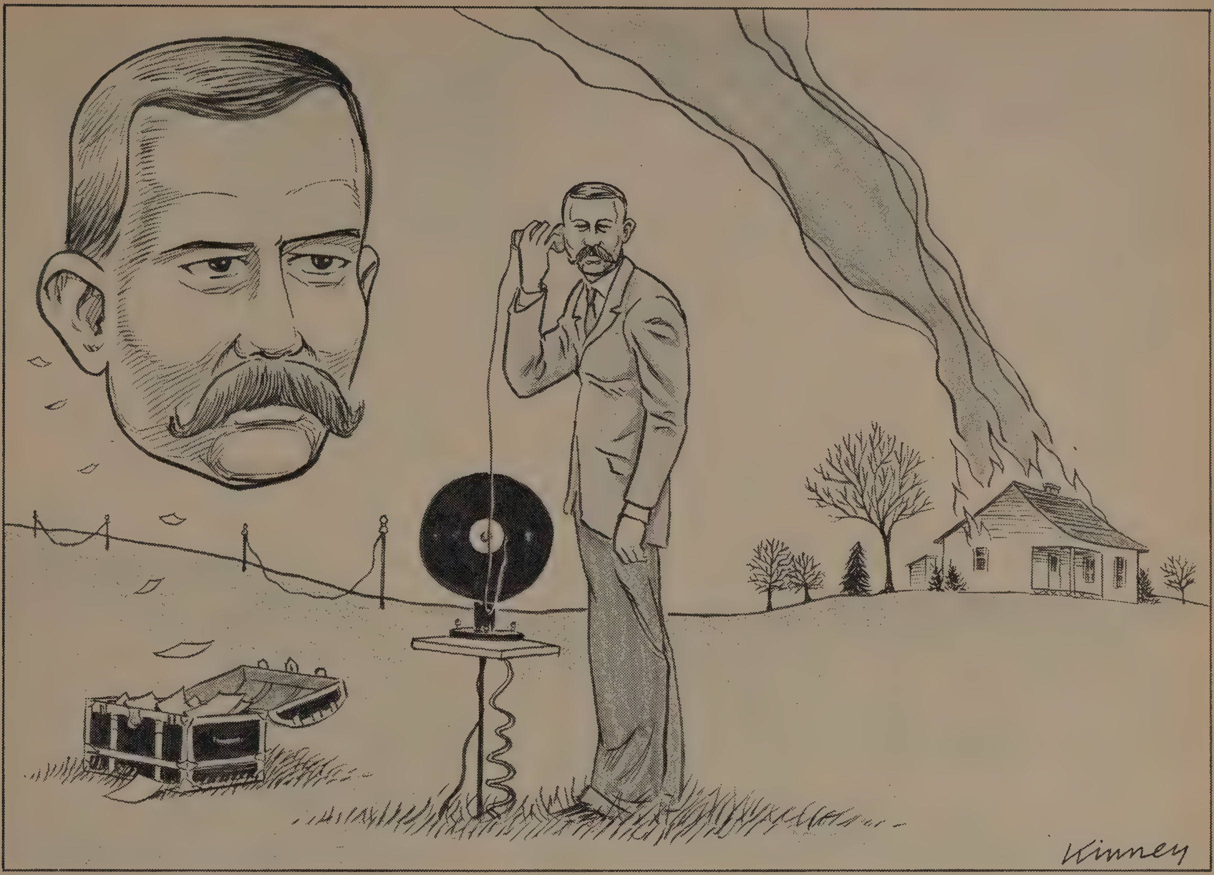
The patent law in effect during the era of broadcast discovery early in this century guaranteed the ground-floor discoverers no more than seventeen years of royalties — and that was if they could collect. Just as the patents provided a stranglehold on the early development of movies, RCA's compilation of radio patents gave it market dominance on receiver sales at a time when broadcasting was a faddish, local phenomenon. (Car dealerships, furniture stores and newspapers owned the early stations.) Network broadcasting was invented by RCA as a method of selling more radio receivers, and the formation of NBC announced in newspaper ads that welcomed the notion of competition. (The more stations, the more sets sold.)

But since the 1920's, the hardware manufacturers have had a willing accomplice in the Federal Communications Commission, whose grasp on the market is its trusteeship of the public "interest, convenience and necessity."

Without exception, the FCC has botched its rules and regulations governing the introduction of new broadcast systems. FM, for example, began in one part of the broadcast spectrum, but the FCC changed its mind and shifted FM radio to the channel-six gap in the TV band, instantly obsolescing the equipment early high-fidelity buffs had purchased. UHF was introduced before the commission required all-channel receivers — sets which can receive both kinds of television. Effective lobbying has halted legislation to do the same sort of thing for radio, to forbid the manufacture of AM-only or FM-only receivers.

And the same is true on the sending end, where the FCC's "type-acceptance" of equipment dictates design and, by extension, price of transmitting equipment in a closed market of 9,000 or so stations. By any sane standards, the price of a 20,000-watt FM transmitter, for example, is inflated by the combination of closed market and the rules that say you can't build your own from scratch. It's been a major stumbling block in the development of scruffy little local stations, and it's the economic reason why there is, as yet, no free-form broadcast television, only some cable experiments.

In such fields as amorphous semiconductors, where the maverick genius Stanford Ovshinsky has set out to co-opt himself through personal incorporation rather than patent licensing, there may be a little breathing space for the odd-wad, go-it-alone inventor. In broadcast, no. If a kid falls asleep over a Tesla biography in his attic laboratory and dreams of the Next Big Breakthrough, the first thing he should do when he wakes up is call a patent attorney and a gerontologist. And a fire extinguisher might be a good idea, too.



The standard histories of broadcasting credit Guglielmo Marconi with wireless and Reginald Fessenden with the radio transmission of voice — two breakthroughs announced to a delighted world at the turn of the century.

Both inventions were old-hat to residents of Murray, Kentucky, where a man named Nathan Stubblefield had done it all approximately a decade earlier.

Stubblefield followed the usual pattern. He was born to a rural family and spent his boyhood curled up with books about electricity, including everything he could find about Nikola Tesla and his bizarre experiments in the transmission of electricity.

Even as Alexander Graham Bell labored to perfect the telephone, Stubblefield was at work on the same effect, vibrating devices which would reproduce speech and sound. A wired telephone system was a simple matter, and residents of Murray, like store-owner Charlie Hamlin, installed the Stubblefield devices and pronounced them superior to Bell's.

In 1892, Stubblefield demonstrated his radio device for Dr. Rainey T. Wells, founder of the town's college. As Wells testified before the FCC more than 50 years later:

"He had a shack about four feet square near his house from which he took an ordinary telephone receiver, but entirely without wires. Handing me this, he asked me to walk some distance away and listen. I had hardly reached my post, which happened to be an apple orchard, when I heard, 'Hello, Rainey, Hello, Rainey,' come booming out of the receiver. I jumped a foot and said to myself, 'This fellow is fooling me. He has wires around somewhere.' "

But Wells convinced himself that Stubblefield did not. By 1902, Stubblefield was ready for a full-scale exhibition of his work. The transmitter was at the Murray courthouse, and Murray's citizens were stationed at five receivers up to six blocks away. Stubblefield's son provided the programming: harmonica solos.

But Stubblefield was peeved by his system's lack of privacy. Because he had no solution to the problem of tuned circuits, he sat on exploitation of his work until that hurdle could be overcome.

Promoters and would-be investors descended on Murray, Kentucky after a newspaper publicized his radio device. But Stubblefield was uninterested in their offers.

Stubblefield was willing, however, to demonstrate the apparatus for scientists who invited him to Washington, D.C. and Philadelphia. The demonstrations were impressive, reported throughout the world.

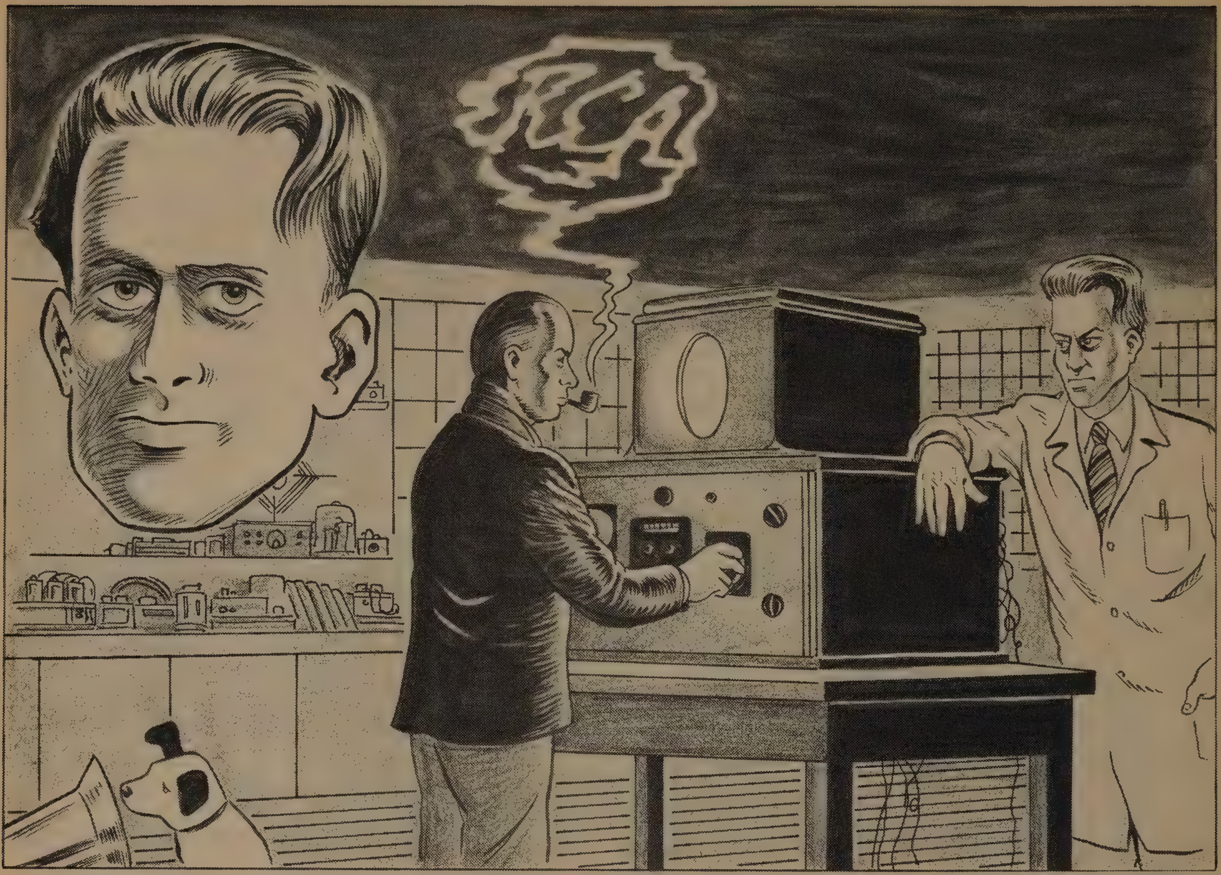
But somewhere between Pennsylvania and Kentucky the trunk with Stubblefield's papers and apparatus vanished. Stubblefield's son claimed it was stolen, and a Kentucky friend pointed out that many of the papers it contained bore a striking similarity to patents secured soon thereafter by Collins Wireless Corporation of Canada. (Frederick Collins had been at the Philadelphia demonstration.)

The final blow was the worthless stock Stubblefield received from promoters of a Wireless Telephone Company of America in exchange for working papers.

Back in Kentucky, Stubblefield became bitter and withdrawn, leaving his wife and family for a hut several miles away. He secured several patents in 1908, but lacked the will to pursue or enforce them. Creditors seized his farmhouse, which then burned to the ground.

For the next twenty years, Stubblefield was a hermit. Neighbors who strayed too near saw wireless lights and heard warning voices coming from the trees.

They found his body in the shack in 1928, his brain partially eaten by rats. The man who invented radio as we more or less know it today had died of starvation. ☐



Philo T. Farnsworth, inventor of television, was a Utah farmboy who liked to read **Popular Science**. When he was eleven, his parents moved to Idaho and a farm with electricity, a distinct novelty in those days. Young Philo built a lab in his attic. Even in 1919, the popular journals were full of articles about TV, but no one had figured out a camera system that would result in good resolution.

At the age of 13, pondering the problem as he plowed his father's fields, Farnsworth thought up the line scan. Far ahead of the other kids in his rural high school, Farnsworth stayed after hours for tutoring with a kindly chemistry teacher, Justin Tolman, and in 1922 on a blackboard in Rigby, Idaho, sketched out the basic ideas which underlie present-day television.

In 1923, at the age of 19, Farnsworth convinced two Salt Lake City backers that he could develop a patent model of of television for $6,000. The estimate was low, but he was convincing enough that he was eventually funded in San Francisco by the immensely conservative Crocker Bank.

On January 7, 1927, Farnsworth applied for the patent on television, and a functioning model was ready nine months later. (The first picture tube was an Erlenmeyer flask converted to that use.) Philo was loath to display TV to his backers, fearing correctly that they would wish to license it immediately to one of the radio giants, such as RCA. He began selling off his own stock in the enterprise to buy fresh capital and time, and shortly after the first newspaper reports on what he had achieved, he suffered the mandatory laboratory fire.

Late in 1929, Crocker Bank left the partnership, and with a new promoter at the helm, Farnsworth went public.

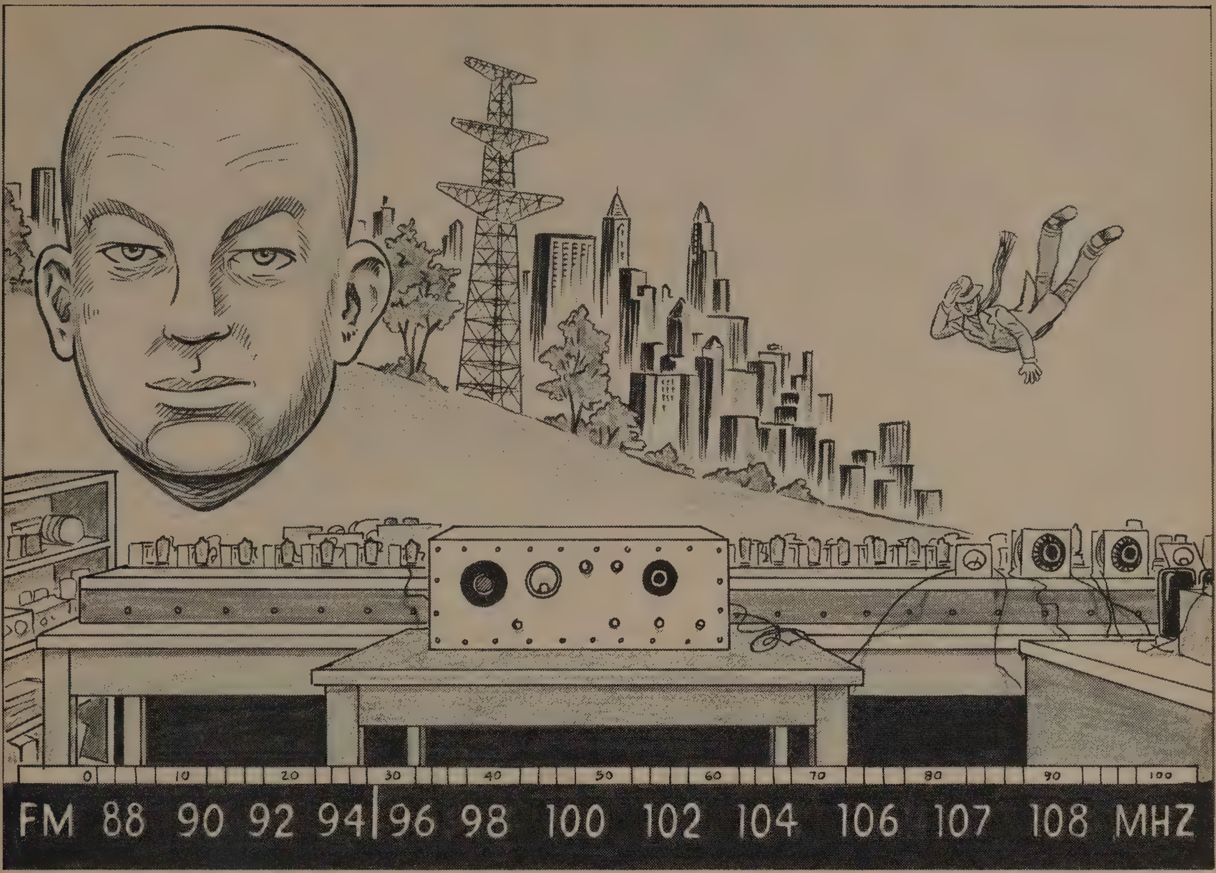
The publicity attracted the attention of Sarnoff, who had hired Vladimir Zworykin to work on television for RCA. Zworykin was an accomplished engineer who had gone quite a long way the wrong way — television with a spinning-disc pick-up system.

Posing as a Westinghouse engineer interested in a licensing arrangement, Zworykin spent three days in Farnsworth's laboratories, making notes and securing a complete understanding of Philo's camera system. In short order, Sarnoff himself dropped by, watched television and left with a clenched jaw when his cash offer of $100,000 for outright control of the patents was rejected.

Farnsworth's strategy had been to forecast the problems of television, solve them and make his money from the patents. His advances beyond the basic idea of the scanning camera included the sawtooth waveform, an image-amplifying system and an anti-ghost circuit. His perfected system supplied a clear image at 220 lines/frame. Farnsworth's son could watch Mickey Mouse on broadcast television at a time when Zworykin and his RCA team were still racing to capitalize on what the Russian emigree had learned during his visit to Philo's lab.

In 1934, Philadelphians lined up at the Franklin Institute for a full-scale TV demonstration. Politicians and vaudeville acts were telecast. Television had, indeed, been perfected.

Sarnoff and RCA sued for patent infringement, claiming that Zworykin had had the same ideas back in 1923. With his old chemistry teacher's recollection of the blackboard episode, Farnsworth won, but RCA appealed. RCA lost the appeal, too, but the effect of the suits was to block fresh investment in Farnsworth's lab. Sarnoff's $10 million investment in Farnsworth's basic idea was protected, and it is Sarnoff and Zworykin who got the glory. Farnsworth is credited in the Encyclopedia Britannica with "picture transmission experiments." □



A patent fight with RCA is an excellent ticket to obscurity in broadcast history, and Edwin Howard Armstrong's was a classic.

Marconi's wireless message across the Atlantic happened when Armstrong was 14, and the event bent the lad in the direction of solitary invention. His goal was not, of course, the invention of radio, but its perfection. In radio's earliest days, one listened with a wired earpiece, and one listened to faint signals fighting their way through a sea of static.

While he was a junior-year student at Columbia University, Armstrong turned his attention to the Audion, the three-element vacuum tube Lee De Forest had invented in 1906.

Although De Forest had invented the tube, he had failed to visualize the circuitry that would permit its use in amplification or transmission. Armstrong saw the answer, a feedback shunt in which the original signal was reamplified again and again. Armstrong's regenerative circuit permitted signals a thousand times louder than anyone had heard before and laid the groundwork for the famous "music box memo" in which David Sarnoff forecast the future of broadcasting.

De Forest, irked by the schoolboy's improvement, challenged Armstrong's patent on the regenerative circuit. The court fight dragged on for fourteen years and ended in De Forest's favor simply because the Supreme Court didn't understand the technical matter before them. The Institute of Radio Engineers refused to withdraw their gold medal to Armstrong and the Franklin Medal, the highest honor in American science, went to him after he lost in court as a gesture ratifying his invention.

As a signal corps major in World War One, Armstrong invented the superheterodyne circuit, which provides the electronic guts of 98 per cent of the radios in use today. By licensing or selling this and other patents to RCA, Armstrong became a wealthy man. He continued his association with Columbia University and the physicist Michael Pupin, but it was the act of a dilettante. Armstrong taught few classes. He remained the solitary inventor.

In 1933, Armstrong turned to the problem of radio static, developing a system of frequency, rather than amplitude, modulation which eliminated the problem. This notion became the pacing concept for the development of present-day high fidelity, but Sarnoff and the others hated it, because it required separate tuning circuits and, thus, costly retooling and advertising efforts.

Armstrong was rich enough to spend $300,000 on a privately-owned FM station to demonstrate the system's value, but Sarnoff and the others relentlessly lobbied the FCC to delay its acceptance and adoption, and World War Two enhanced their tactics.

When FM broke through the artificially-imposed barriers against it after the war, Armstrong was forced into court to sue for retrieval of patent rights and to prove an RCA-NBC conspiracy against his invention.

The strain of the fight was too much for him. Late on the night of January 31, 1954, he sat in his skyscraper apartment and wrote a love letter to his wife. Then he put on his coat, hat and gloves and walked out the thirteenth-story window.

Less than two years after his death, RCA tacitly acknowledged Armstrong's charges against the company with a million-dollar settlement to his widow. The rest of the industry followed suit, although it was 1967 before vindication was complete. ■

TESLA

He wasn't from Venus, merely Yugoslavia, but his vision of broadcast pointed in a direction few have traveled. Thirty-five years after his death, the work begins anew . . .

BY BUD SPURGEON

We depend upon a system of generating and distributing electrical power which is both ubiquitous and completely taken for granted, a fact brought home sharply to anyone who has lived through a power blackout.

This system of electrical power, whose essential elements are the same worldwide, is mostly the invention of an extraordinary scientist named Nikola Tesla. Tesla, a Serbo-Croatian immigrant to the United States, discovered the principle of the rotating magnetic field in a single flash of creative vision, and his application of that vision in the alternating current (AC) induction motor and the polyphase system of AC generation and distribution forms the foundation of technological civilization. Tesla's patents of 1888 were so complete that no basic changes have been made for over eighty years.

Tesla also is responsible for the first tuned radio circuits, for discoveries in gaseous and fluorescent lighting, for the use of high frequencies in medicine, for the first demonstration of robotics, and much more. Yet the name of this prolific inventor, who lived and worked in New York City around the turn of the century, is virtually unknown.

Many of his discoveries were so basic and so far ahead of his time that even today, scientists comb his sketchy notebooks looking for new ideas. For example, in 1976 a huge Tesla coil (a high frequency current transformer) was constructed in an Air Force hanger in Wendover, Utah. The last time that such a large coil had been built was by Tesla himself in Colorado Springs in 1899. Operating at the unheard of power of 12 million volts and up, he accidentally had produced ball lightning during experiments aimed at something quite different. Today Robert K. Golka has become the second man in history to generate such high voltages and his coil is an exact copy of the one used by Tesla nearly 80 years ago. Golka, who is working under a federal grant, has instituted Project Tesla and intends to study the ball lightning generated by Tesla's coil.

We don't know much about ball lightning, but most theories agree that it is a plasma held together somehow by surface tension. Exactly how this surface tension manages to contain the plasma is a matter of great interest to researchers in fusion power. Tesla's coil turns out to be the only known way to produce artificially the phenomenon of ball lightning, whose very existence was denied by scientists until recently. For such an old experiment to become so immediately useful in science is a rare occurrence — but then, Tesla was a rare individual.

He was born in 1856 in the village of Smiljan, in what is now Yugoslavia. His father was the pastor of the local Serbian Orthodox church. His mother was illiterate, but she was well known in the village for her ability to invent labor-saving household devices.

By the age of fourteen, Tesla had become a voracious reader in four languages. He also could solve mathematical problems in his head almost instantly. By now, Tesla's family was living in the city of Gospic. Tesla had been asked to catalog the local library, and while he was working on this task he was stricken by a long illness. He fell into a deep depression and the town's doctors gave up hope for his recovery. To help pass the time Tesla asked that books be brought from the library to his home and while reading one of them, he suddenly recovered his will to live. The book that cheered him up was by Mark Twain, and he later credited it with saving his life. Much later, when Tesla met Twain in New York, they became close friends.

Tesla first became aware of the problem which would lead him to the discovery of the rotating magnetic field in 1877. Then 22 years old, he was in engineering training at the Polytechnic School in Graz, Austria. There, his physics teacher, Professor Poeschl, demonstrated a newly acquired direct current (DC) motor called a Gramme machine. The motor would generate DC electricity if turned by some force, and also would act as an electrical motor if DC power was applied to it. The design included a commutator and brushes which sparked a great deal, and Tesla believed that the sparking could somehow be eliminated. Poeschl devoted an entire class to a scathing lecture demonstrating the "fallacy" of Tesla's idea, but Tesla was unmoved.

The answer came to him five years later in one of the stranger examples of scientific inspiration ever recorded. In 1882 Tesla was working as the chief electrician for the new telephone company in Budapest. On an evening in Feburary he was walking through the city park with a friend named Szigeti. They had stopped to admire the sunset and Tesla, drawing upon his prodigious memory, began reciting some of his favorite lines from *Faust:*

> "The glow retreats, done is the day of toil;
> It yonder hastes, new fields of life exploring;
> Ah, that no wing can lift me from the soil,
> Upon its track to follow, follow soaring. . . ."

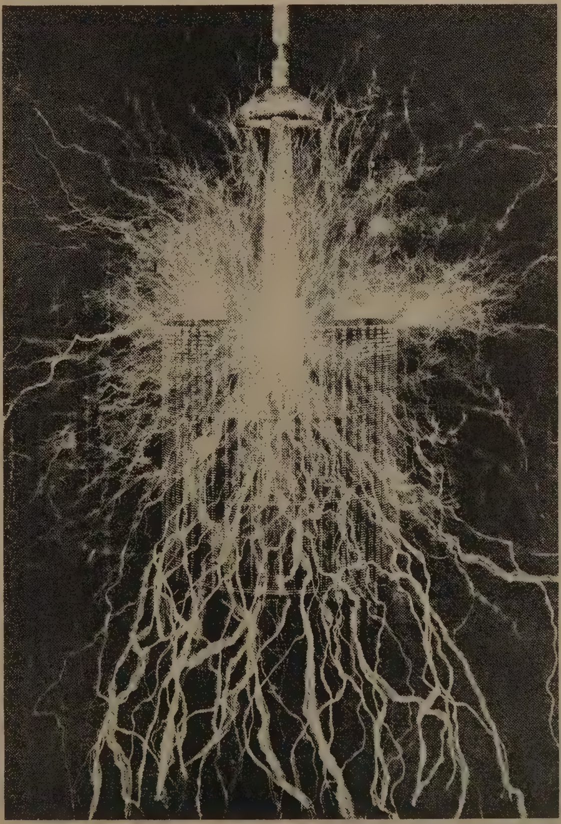
And then, as Tesla tells it,

> "As I spoke the last words, plunged in thought and marveling at the power of the poet, the idea came like a lighting flash. In an instant I saw it all, and I drew with a stick in the sand the diagrams which were illustrated in my fundamental patents of May, 1888, and which Szigeti understood perfectly."[1]

The diagrams Tesla drew for Szigeti, while containing the solution to the problems of the electric motor, were also the essence of a system of electrical power which would change the world. Tesla had the ability to visualize the products of his imagination with such intensity that as a child he often had confused his visions and the real world. Later this ability made it possible for him to imagine a motor, for instance, and then mentally to build the motor from scratch, run it, and then inspect it for wear. Using this talent, Tesla was able in just two months after his vision in the park to design mentally all of the elements of the electrical power system he later would patent.

Since he was unable to interest anyone in Budapest, or later Paris, in backing his new system, Tesla decided to emigrate to America. He landed in New York with four cents, some poems he had written, and a plan for a flying machine. He also had a letter of introduction to Thomas Edison, and he immediately began working at the Edison lab in New York. Edison and Tesla were completely different in temperament and method, and a split-up was inevitable. Tesla had an excellent European education, was a fine mathematician, and could speak and read several languages. Edison had very little formal education and had been known to make statements such as, "I can hire mathematicians, but they can't hire me."

Tesla walked out a year later, after Edison reneged on a promised bonus. Tesla then went to work on a new arc-lamp street lighting system for backers who had promised him great rewards, but who delivered only a nearly worthless stock certificate when the work was done. Tesla had reached the low point of his career, and he was forced to spend the next year as a day laborer digging ditches, until a chance acquaintance led to new backers who set up the Tesla Electric Company and funded a lab.



Effect of an electrical oscillator delivering energy at a rate of seventy-five thousand horse-power.

Finally in control of his own lab, Tesla exploded into creativity and began building models of all the machines he had been mentally refining for years. All of his models worked the first time, and in 1888 he was granted patents to generators, transformers, and motors making up an entire system of polyphase AC power.

George Westinghouse was the first to recognize the significance of Tesla's system, and during a meeting with the inventor in his lab, Westinghouse reportedly offered him one million dollars for his patent rights and a dollar-per-horsepower royalty on all the generators. This royalty has been estimated to have been worth 12 million dollars during Tesla's lifetime, but Tesla later waived it to help prevent Westinghouse from going bankrupt. Another report has it that Westinghouse offered only $200,000 for the patent rights, but by any account, it was the bargain of the century.

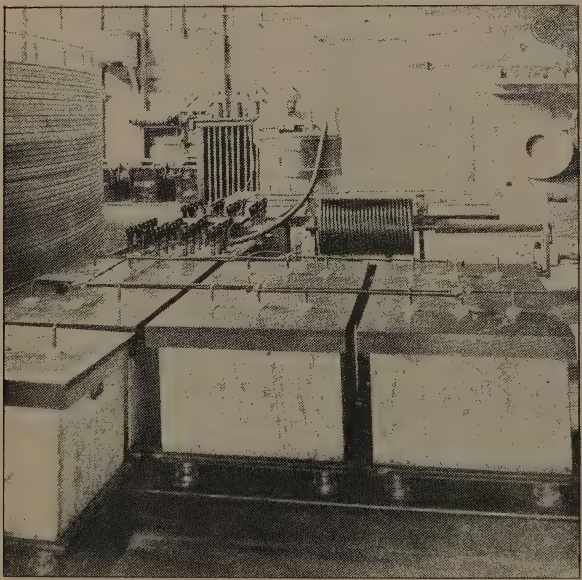
In any event, Tesla was delighted by the sale. After paying off his backers he still had money left to spend as he wished. It seems that Tesla had only one desire, to explore the strange world of electricity. He had dedicated his whole life to that end, never marrying, saying that an involvement with a woman would take too much away from his work. He had very few close friends and he made it a habit never to confide in any of his laboratory assistants. No one but Tesla knew what research he was considering or what new inventions he was working on. He preferred it that way, declaring that unlike other experimenters he could name, all of his work was his own. Since he had such a fine memory he wrote down only the scantiest of notes and much of what he did or planned to do is lost forever because of this habit.

After selling his patent rights, Tesla went to Pittsburgh to help Westinghouse build his polyphase system and his motors. Apparently Tesla disliked working with other engineers and he left Pittsburgh after only a year, despite the offer of a huge salary and a lab. After this experience, Tesla refused to work under anyone again. He maintained that he could get his work done only if everything was under his personal control. Also, Tesla appeared constrained by association with experimenters who were, in his eyes, groping their way into the study of electricity.

By contrast, Tesla had been thinking deeply about this mysterious force for years. His vision in Budapest not only revealed the basis for a new motor, but also the profound nature of alternating currents. Years of thought had convinced Tesla that the vibratory nature of these currents contained great powers. He saw all of nature as a vibratory phenomenon and he also saw parallels between the resonant circuits he would go on to develop and the acoustical resonance which is a property of all matter. Tesla concentrated his thinking on electrical and mechanical vibration and resonance, and it was this concentration on fundamental principles of nature which probably helped put him far ahead of all the other experimenters of the time. To work with mere thinkers was anathema. He had bigger fish to fry.

With his fine training in mathematics and his strange ability to visualize, Tesla was able to produce whole streams of inventions, often working in several areas simultaneously. This is what occurred when he returned to his New York lab in 1889. He immediately began to expand the frontiers of electrical science with studies of higher frequencies in alternating currents. Work in Pittsburgh had shown that 60-cycle alternating power was slow enough to turn a motor with force, yet high enough to prevent the perception of a flicker in electric lights. Now Tesla was wondering about the world above 60 cycles.

He began experiments for which he built mechanical generators and resonating coils to produce high frequency power. One of these was an elegant reciprocal generator whose output was so stable that Tesla built and ran a clock from it, and this became the first demonstration of electronic timekeeping. His generator would run on steam or compressed air, and through the interaction of its mechanical and electrical parts it was able to maintain a stable rate of vibrations. It had no valves or other moving parts except the shaft to which the main cylinder was attached.[2]



Essential parts of the electric oscillator used by Tesla.

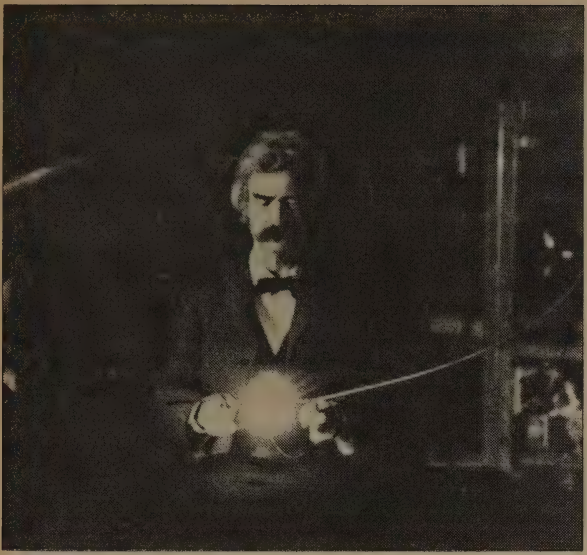
Tesla had spent quite some time perfecting the mechanical portion of the generator and he used just this portion for experiments in mechanical resonance. One of these experiments consisted of a platform to which he had attached the cylinder, the platform insulated from the floor with cork. Anyone who stood on the platform would experience a very pleasant massage, but the oscillations were so "pure" that other effects could, and did, occur. One story about these other effects is told in John J. O'Neill's biography of Tesla, Prodigal Genius. O'Neill tells of the time Mark Twain stopped by to see what Tesla was up to. Twain decided to try out the vibrating platform and found it much to his liking, so much so that he refused to get off despite Tesla's warnings. Twain suddenly discovered the reason for Tesla's concern and left the platform rapidly, heading for the bathroom. (The device had a powerful laxative effect.)

". . . [he could] imagine a motor, then mentally build it from scratch, run it, and then inspect it for wear, all in his head."

In another experiment Tesla bolted the cylinder to an I-beam in his lab. The vibrations, carried through the beam into the foundations of the building, spread throughout the neighborhood and caused a small earthquake, breaking windows and pipes and exciting the neighbors. When the vibrations eventually centered on his own lab and threatened to destroy the building, Tesla managed to stop the machine with a blow from a sledgehammer.

In his efforts to increase the frequencies of his electrical experiments Tesla was forced to invent new methods of insulating wires and new forms of capacitors. He hit upon the method of immersing capacitors and other components in oil, a revolutionary technique for the times, but one still in use today. He went to these extremes because high frequency power is difficult to contain and would just as easily travel through the air as through copper wire.

At this time Tesla began building the series of air core conical transformers which have become known as "Tesla coils". The action of the coil depends on the resonant electrical vibrations produced by the interaction of the coil with a capacitor, and very high voltages were possible. The mechanical analog of this sort of resonance can be seen in the wooden bridge which collapses because soldiers march over it in unison — each vibration is timed to reinforce the preceding one and enormous forces are built up. Since Tesla's coils operated on electricity, these forces were built up instantly and were limited only by the size of the coil. One only needs to build larger coils, as Tesla did in Colorado Springs or as Golka has done recently in Utah, in order to generate huge voltages.



The high tension current being passed through the body before it brings the lamps to incandescence. The loop is held over the resonating coil by Mr. Clemens (Mark Twain).

Since these coils resonated at a known frequency, and since the energy they developed was of a type that would travel easily through air, it became a simple matter for Tesla to provide another coil tuned to resonate at the same frequency which would pick up some of the energy radiated by the first coil. He refined the method by tuning the coils to respond to quarter wavelengths, which are nodal points of zero movement in an oscillating system. By tuning his coils to respond to quarter wavelengths Tesla had discovered a method whereby the controlling end of his coils would have no electrical movement while the other end would shoot off high voltage sparks. This elegant system is the basis of our tuned radio circuits today. Tesla knew the secret of tuned circuits several years before Marconi sent a Morse code "S" crackling across the Atlantic in his primitive demonstration of wireless telegraphy.

Tesla began using his system to broadcast electricity across his lab, running motors and lighting lights with just one wire connected to the power source, and sometimes without any connecting wires. He also was developing new light sources at this time, one of them a bulb with a single wire going to a carborundum button which became incandescent when connected to high frequency power. Other lamps were sealed glass tubes which would glow under electrical bombardment. He lit these by running a wire around the ceiling of his lab and connecting it to one of his coils. The tubes would glow without any connecting wires, and this became his favorite method of lighting his lab. If he needed more light, he simply picked up one of the tubes and hung it next to the work at hand. Pictures taken at this time show that he had had the tubes bent into shapes such as stars and even words — the first demonstrations of neon lighting, an invention which many might agree would have been better left undone.

It was around this time that Tesla published his observations of the effect of high-frequency currents on the human body — a heating effect. He suggested that medicine might find a use for it, and this is what happened some years later under the name Diathermy. Among other things, the treatment was used for the relief of arthritis symptoms.

Somehow or other Tesla also found time to develop thermomagnetic motors, little devices which took advantage of the sudden loss of magnetism that occurs when a magnet is heated to a certain temperature. He succeeded in producing small reciprocating motors using only magnets and a small flame for their power. The motors never produced very much power, and even Tesla couldn't figure out what to do with them. He designed, but never built, a large AC generator based on this effect. It had one moving part.

In 1891 Tesla began giving public lectures on his work. At the first, in New York, he revealed his new coils and lamps. He went on to London and Paris in 1892. He had the satisfaction of having risen from unknown ditch-digger to world-famous scientist in only four years.

Part of the reason he had so much to demonstrate was the pace he set himself. He slept only five hours a night, or less, and worked every day of the week. However, now that he had money and had become famous, he allowed himself to relax a bit and began giving social demonstrations in his lab. Such an evening began with a gourmet meal at his reserved table at Delmonico's, and then Tesla and his guests trooped to his lab where he generated huge sparks and photographed his guests holding bulbs that glowed while unconnected to anything else. He had a fine sense of the dramatic, and seemed to enjoy posing as the high wizard of electricity.

Tesla gave demonstrations at the Chicago World's Fair of 1893, and the fair was lighted and powered by an AC system installed by Westinghouse. It was the first large scale practical demonstration of alternating current. Late that same year, the final confirmation of Tesla's system came with the announcement that the Westinghouse plan had been chosen to generate power from Niagara Falls.

> "The vibrations, carried through the beam into the foundations of the building, spread throughout the neighborhood and caused a small earthquake . . ."

Up until then Thomas Edison had been fighting the introduction of Tesla's system, which Edison correctly feared would run his direct current generating system out of business. Edison had launched a publicity campaign in which he claimed that AC power would instantly kill anyone who ran afoul of it. Since there was no love lost between Edison and Westinghouse, the campaign got ugly. Edison paid children around his lab 25¢ per head to round up stray dogs and cats for him. He electrocuted these unfortunate animals in front of reporters in a gruesome demonstration of the "dangers" of AC power.

A former Edison lab assistant who called himself "Professor" H. P. Brown electrocuted dogs on stage as an example of the "humane" executions which the use of AC power offered. New York State became the first to adopt Brown's "humane" method of execution and hired Brown to install a system using three Westinghouse generators supplying power to the first electric chair. The first person to be electrocuted, a condemned murderer named William Kemmler, had to be zapped several times since Brown had miscalculated and the power was too low to kill him outright. Nevertheless, the electric chair caught on, and its use to the present day stems from Edison's campaign to descredit alternating current.

Once Tesla's system became accepted as the only practical means to harness the power of Niagara Falls, Edison had to admit defeat. All of the generating plants Edison had built were converted to the much more powerful and flexible system which was Nikola Tesla's greatest contribution to the world.

Tesla, meanwhile, decided to return to work in his lab to the exclusion of all else. His mother had died while he was in Europe and he had fallen ill after her funeral. While recuperating he took stock of his efforts up to then and decided that he had been spending too much time frivolously giving dinner parties, demonstrations, lectures, and the like.

All of his efforts were now directed toward the development of his system of electrical broadcasting which, he felt, would supplant AC line transmission and bring wealth beyond his needs.

His idea was to broadcast power impressed onto the electrical field of the earth itself. Once the system was put into action, one would need only stick an antenna into the air and a ground stake into the earth in order to draw off electricity for use in lights and motors anywhere on the planet. In 1894 he gave an interview in which he described the idea and mentioned sending messages worldwide by the same method.

However, in March of 1895, while Tesla was adding the finishing touches to a prototype of his system, his laboratory burned to the ground. His matchless equipment was destroyed and his records and papers were lost. Worse yet, the lab was not insured, and Tesla had run out of the money from the Westinghouse sale.

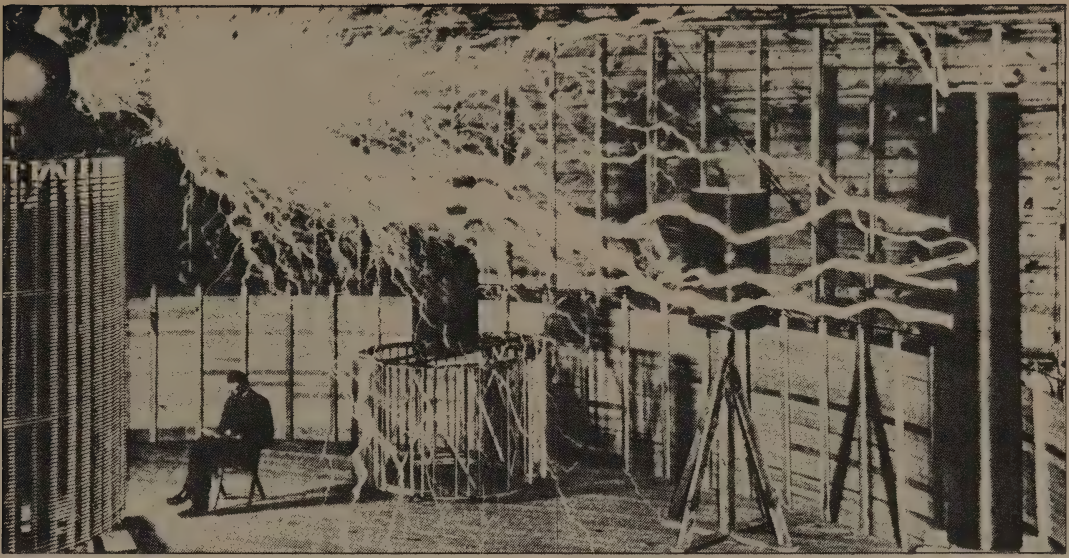
Trading on his fame, Tesla managed to secure new backers. It took him over a year to rebuild the equipment that had been lost in the fire. Finally, in 1897, he tested his system by sending signals from his lab to a boat on the Hudson, 25 miles away. His first public demonstration of the broadcasting system was combined with the first demonstration of an electronic robot. Tesla's robot was a radio-controlled boat. The demonstration was held in Madison Square Garden in 1898 and it was a huge success. A large tank had been built in the hall for the boat to float in. The boat itself was several feet long, made of iron with a sealed top, and looked like a peculiarly modified Victorian bathtub.

Due to patent considerations, Tesla did not reveal that he also had a method for building a loop antenna into the hull of the boat and for making much more sophisticated systems of tuned circuits. The boat he demonstrated had an antenna sticking up from the top and only simple circuits inside to flash lights, steer the rudder, and so on. Crowds jammed the hall to watch the boat, shouting directions. Tesla would manipulate the switches so that the boat would respond, and to the people there it seemed like magic. To Tesla it was ". . . the first of a race of robots, mechanical men who will do the work of the human race."

More than fifteen years later Tesla wrote about his discoveries in robotics, which he called "Teleautomatics," in an unpublished article quoted in **Prodigal Genius**. There he discusses his boat and then goes on to talk about his plan for a new kind of flying machine. He says:

"As stated on a previous occasion, when I was a student at college I conceived a flying machine quite unlike the present ones. The underlying principle was sound but could not be

Light tubes glow on the Colorado plains. No wires. The source of the transmitted power is more than 20 miles away.



The casually seated figure is probably Tesla himself. Very high voltage, combined with an AC frequency of some 20,000 cycles, produced the astonishing, though relatively harmless, discharges shown here.

carried into practice for want of a prime mover of sufficiently great activity. In recent years I have successfully solved the problem and am now planning aerial machines devoid of sustaining planes, ailerons, propellers and other external attachments, which will be capable of immense speeds and are very likely to furnish powerful arguments for peace in the near future. Such a machine, sustained and propelled entirely by reaction, can be controlled either mechanically or by wireless energy. By installing proper plants it will be practicable to project a missile of this kind into the air and drop it almost on the very spot designated which may be thousands of miles away. But we are not going to stop at this.

Here we have, in an article written around 1915, a clear description of guided missiles and the first intimation of electronic computers.

After his successful demonstration in Madison Square Garden, Tesla continued work on the broadcasting system, but now two problems presented themselves. First, Tesla had reached the limits of his laboratory to contain the large coils he was building. Bolts of electricity and sheets of "electric flame" were hitting the walls and ceiling; he obviously needed a bigger lab. Second, Tesla was out of money again. After his lab burned in 1895, he had refused a deal that required taking on the son of one of his backers as a silent partner.

Tesla's public attitude was aloofness, which, combined with his towering height and elegant clothes, served to intimidate. While his behavior would not have been exceptional in European circles, in America Tesla was considered by many to be "putting on airs". His personality made it difficult for him to attract new money, merely enough to allow him to continue his work on the broadcasting system.

Following invitations from his patent attorney and the Colorado Springs Power Company, Tesla left for Colorado Springs to continue his experiments. There he built a large wooden lab building and equipped it with a monstrous coil. In 1899 Tesla succeeded in verifying to his satisfaction that his system was feasible. It was also here that he became the first person to artificially produce ball lightning, and, finally, here that Tesla received what he believed were signals from another planet.

In one recent account of Tesla's life it was suggested that the announcement Tesla made of this discovery was the first sign of mental instability on his part, perhaps due to the death of his mother. While there is no doubt that Tesla was deeply affected by his mother's death, the announcement, which was printed in *Collier's* in 1901, is quite a document and reads very lucidly.

Tesla begins by speculating on the possibility of life on other planets and notes that it need not be organized along chemical processes familiar to us. He then describes the equipment he was using at the time he received the signals and says:

"One of the most interesting results, and one of great practical importance, was the development of certain contrivances for indicating at a distance of many hundred miles an approaching storm, its direction, speed and distance traveled. These appliances are likely to be valuable in future meteorological observations and surveying, and will lend themselves particularly to many naval uses."

This device sounds like a description of some sort of radar, but, typically, no written details of the device seem to exist. Descriptions like this one crop up all through the material on Tesla and can be pretty frustrating. Tesla then describes the moment of discovery:

"My first observations positively terrified me, as there was present in them something mysterious, not to say supernatural, and I was alone in my laboratory at night; but at that time the idea of these disturbances being intelligently controlled did not yet present itself to me. The changes I noted were taking place periodically, and with such a clear suggestion of number and order that they were not traceable to any cause then known to me. I was familiar, of course, with such electrical disturbances as are produced by the sun, Aurora Borealis and earth currents, and I was as sure as I could be of any fact that these variations were due to none of these causes. . . . A purpose was behind these signals; and it was with this conviction that I announced to the Red Cross Society, when it asked me to indicate one of the great

Nikola Tesla

possible achievements of the next hundred years, that it would probably be the confirmation and interpretation of this planetary challenge to us."

He then goes on to become the first person, to my knowledge, to propose that extraterrestrial communication be based upon mathematical principles, and says:

"Absolute certitude as to the receipt and interchange of messages would be reached as soon as we could respond with the number 'four,' say, in reply to the signal 'one, two, three.' . . . the inhabitants of whatever planet had signalled to us would understand at once that we had caught their message across a gulf of space and had sent back a response."

Tesla never had the opportunity to repeat his experiment and to determine just where the signals were coming from. But even if we assume that the signals were terrestrial in origin, Tesla still displays an understanding of the possibilities of extraterrestrial communication and an insistence on scientific principles that would do credit to a modern day astronomer working on the same subject.

The strange signals were just one part of Tesla's work at Colorado Springs. The citizens of the town became reluctant observers of the huge bolts of man-made lightning and the loud thunderclaps that occurred while the coil was operating. During the experiments the surrounding atmosphere would become ionized to the extent that butterflies in the area flew around in confused circles, a blue glow covering their wings. To draw a glass of water in town meant getting a static shock from the faucet. In order to keep people away from his lab and possible harm, Tesla announced that he was working on a new weapon that could kill 300,000 people at one time. The ruse worked, but it also started all manner of rumors about the "true" nature of Tesla's work while in Colorado Springs. Tesla conducted his most important experiments dressed in coat and tails as usual, with his height increased by three-inch rubber soles he had added to his shoes to prevent getting shocked.

During his experiments, Tesla succeeded in lighting lamps at a distance of 26 miles from the main coil. He declared that his experiment was a success and that he had managed to build up the natural electrical oscillations of the earth into regular waves carrying large amounts of power. Now he proposed to build a suitably sized power station and give a practical demonstration of his world-wide system of broadcasting "power and intelligence" through the entire planet. The only problem was one Tesla had been fighting since 1895 and one he would suffer from the rest of his long life – he was broke again.

When Tesla returned to New York late in 1899, a close friend named Robert Underwood, one of the editors of *Century* magazine, invited him to submit an article about his latest work for inclusion in their special turn-of-the-century issue. "The Problem of Increasing Human Energy," subtitled "With Special Reference to Harnessing the Sun's Energy," reveals Tesla as a technological visionary of the first order.

He begins by postulating that the mass of humanity must respond to classical calculations of force and acceleration. The concept is totally mechanistic, and reveals the Newtonian thinking that was the basis for Tesla's ideas. The theories of Einstein and Heisenberg were still in the future and so Tesla proceeded from the best available understanding of the world at the time. Even though that understanding was composed of a clockwork concept of the universe, he still manages to reach some startling conclusions.

For one, he demonstrates in the article that burning fossil fuels to produce electricity is "barbarous" and thoroughly wrong. He then recommends that only water power be used for generating electricity and says:

"Evidently all electrical energy obtained from a waterfall, saving so much fuel, is a net gain to mankind, which is all the more effective as it is secured with little expenditure of human effort, and as the most perfect of all known methods of deriving energy from the sun contributes in many ways to the advancement of civilization."

He goes on to say that his broadcasting system began with the discovery that he could send power through the air and was complete when he realized that he could cause resonant oscillations to occur in the earth's electrical field. His plan, then, was for all of the power needed on the planet to be supplied by hydroelectric generators stationed next to rivers all around the world. By using his broadcast system everyone's needs would be supplied by a power system based upon renewable energy and, he declared, this was the best way of harnessing the sun's energy.

In another part of the article Tesla discusses forces which impede human progress, and concludes that the greatest of these is organized warfare. In what must be one of the earliest descriptions of an arms race Tesla says:

> "It has been argued that the perfection of guns of great destructive power will stop warfare. So I myself thought for a long time, but now I believe this to be a profound mistake. Such developments will greatly modify, but not arrest it. On the contrary, I think that every new arm that is invented, every new departure that is made in this direction, merely invites new talent and skill, engages new effort, offers a new incentive, and so only gives a fresh impetus to further development. . . . Nor do I believe that warfare can ever be arrested by any scientific or ideal development, so long as similar conditions to those now prevailing exist, because war has itself become a science, and because war involves some of the most sacred sentiments of which man is capable. In fact, it is doubtful whether men who would not be ready to fight for a high principle would be good for anything at all. It is not the mind which makes man, nor is it the body. Our virtues and our failings are inseparable, like force and matter. When they separate, man is no more."

He recommends mutual arms reductions as ". . . the first rational step to take toward diminishing [this] force retarding human movement," and he predicts that his Teleautomata would finally evolve into war machines which would fight against other war machines and render war bloodless. In an age when "smart" bombs have been used against civilians, we all know better – but it was a nice thought.

The upshot of the article is that Tesla, once having realized that the energy for our society must come from renewable resources, set out over eighty years ago to perfect a system capable of realizing that goal. His work on the broadcasting system was entirely motivated by this desire to build an electrical energy system based on renewable resources. He was working on this years before anyone realized that a society could even require such large amounts of electrical power. Electricity at that time was used only for very limited lighting systems. The idea that society could become dependent upon this power had occurred to no one but Tesla.

The article attracted a great deal of attention. One of those interested was the millionaire J. P. Morgan, who invited Tesla to his home to explain his system in detail. Morgan agreed to underwrite part of the first phase of Tesla's project, a gigantic radio broadcasting system on Long Island. The money Morgan advanced was not nearly enough to complete a project of the size that Tesla envisioned, but it was a start. Tesla planned to locate a huge tower in Suffolk County on Long Island under an agreement with a local developer, who in turn hoped to sell houses to the thousands of people who would eventually work at the project. The development was to be called Wardencliff.

It is hard to convey the scope of the project Tesla had in mind. To the man who thought he could vibrate the entire planet at will, nothing less than a worldwide broadcasting system would do. He planned to establish a monopoly on *all* forms of broadcasting and a list of the services he intended to provide was printed in a brochure he published at the outset of work on Long Island. *[See box.]*

The Wardencliff Vision

The first World System power plant can be put into operation in nine months. With this power plant it will be practical to attain electrical activities up to ten million horsepower and it is designed to serve for as many technical achievements as are possible without undue expense. Among these may be mentioned:

1. Interconnection of the existing telegraph exchanges of offices all over the world;
2. Establishment of a secret and non-interferable government telegraph service;
3. Interconnection of all the present telephone exchanges or offices all over the Globe;
4. Universal distribution of general news, by telegraph or telephone, in connection with the Press;
5. Establishment of a World System of intelligence transmission for exclusive private use;
6. Interconnection and operation of all stock tickers of the world;
7. Establishment of a world system of musical distribution, etc;
8. Universal registration of time by cheap clocks indicating the time with astronomical precision and requiring no attention whatever;
9. Facsimile transmission of typed or handwritten characters, letters, checks, etc.;
10. Establishment of a universal marine service enabling navigation of all ships to steer perfectly without compass, to determine the exact location, hour and speed, to prevent collisions and disasters, etc.;
11. Inauguration of a system of world printing on land and sea;
12. Reproduction anywhere in the world of photographic pictures and all kinds of drawings or records.

This was 1901, in an era of feeble spark-gap radios, and years before anyone else had even thought of a radio broadcasting system. The first description of the concept of a radio broadcasting system is usually dated from 1916 when David Sarnoff wrote his "Music Box Memo", detailing an idea of having radios broadcasting music to homes in the United States. This was considered a breathtaking idea, but contrast the simple concept of a "music box" with the enormous system Tesla had planned to implement sixteen years before.

The actual operation of his radio system was a science known only to Tesla. He had planned also to build a similar system which would broadcast pure electrical power from Niagara Falls, but this never got off the ground. The Wardencliff project went as far as the construction of the power building and a dome-topped wooden tower about 150 feet high. At this point Morgan apparently lost interest and refused to advance the money needed to complete the project, despite Tesla's pleadings. Once it was known that J. P. Morgan had pulled out of the project, no one else would advance money, and Tesla's World System collapsed. With just a few more months and more money the prototype might have been completed, but it was not to be. The equipment of the partially finished station was repossessed, spelling an end to Tesla's attempt at worldwide broadcasting.

Would the system have worked? Did Tesla seriously intend to deliver all of the services he listed? Could he have done it? The answer to all of these questions is, no one knows. It is generally considered impossible to transmit power by the method Tesla outlined, due to the resistance of the Earth's crust. The power should be converted into heat by the resistance of non-conducting rock. Tesla must have known this. Did he have a method which would get around this problem? Our knowledge of electricity would seem to indicate that his system was impossible, and further, he never practically demonstrated his idea. We have only his word and some very sketchy notebooks to say that he was capable of accomplishing this feat. And there the matter stands.

But not quite . . . .

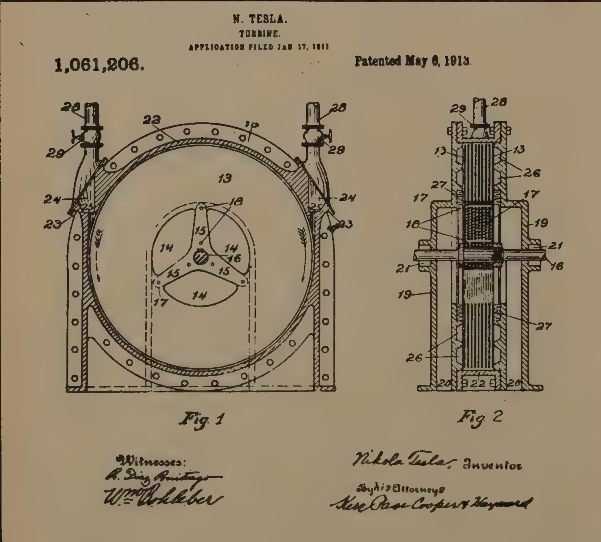
It should be noted that electricity is still a theory. The electric force which has become so commonplace today is still a *mysterious* force. No one I have questioned who is familiar with the science is willing to totally condemn Tesla's idea, simply because our understanding of both Tesla's idea *and* electricity is not total.

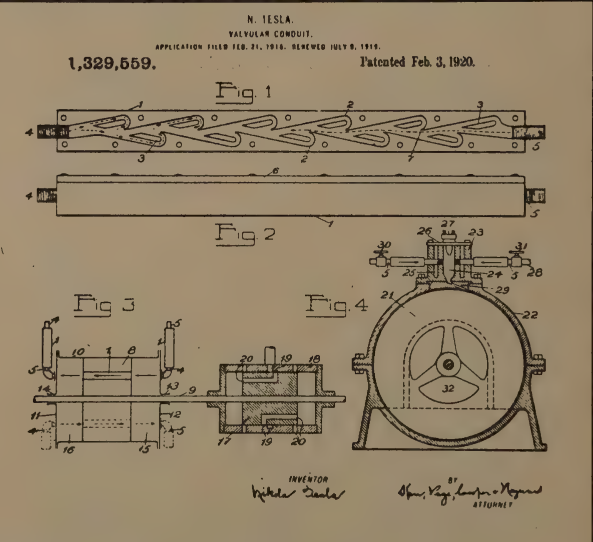
Interestingly enough, while researching this article, I discovered that Tesla believed he was manipulating electricity in a manner fundamentally different from all other experimenters. All of the articles and books I have read either assume that Tesla was using electricity in the usual way or gloss over the difference by maintaining that he was just using different language to describe standard effects in his work. Yet Tesla says that he was not using electricity in the standard way. The distinction he makes is a subtle one, but he insists that it was central to his work. The full story has yet to be told. Tesla's "madman" status in the history of electricity has so far kept many from taking his ideas seriously. Tesla has even been the subject of books claiming that he was from Venus and that he landed here in a flying saucer.

The man deserves better than this. Tesla spent his life working in the physical sciences and he demanded proofs of his experiments as rigorously as any other scientist. His lectures show that he was well aware of other experimenters' work at the time and that he felt he knew exactly what he was up to. The problem hinges on the lack of records detailing his experiments and their results. A close reading of his published lectures of 1891, '92 and '93 reveals that he was adamant about the fundamental difference between the effects he observed and those observed by others. Those who ignore these protests do him a disservice and, quite possibly, may have missed the entire point of his later work.

The collapse of the Wardencliff project spelled the end to Tesla's major electrical investigations. He would never again have enough money to start a lab, and due to his refusal to develop other patents of his into money making projects, he had no significant income. He had gambled all or nothing, and lost.

The last major project Tesla worked on was an idea for a new kind of turbine engine. He had developed an elegant device consisting of several discs spaced apart from one another along a common shaft. Holes were drilled into the discs near the point where the shaft went through them. Discs and shaft were encased in a chamber and steam, compressed air, or an exploded air/fuel mixture was directed against the edges of the discs, and would then travel between them to the center and exhaust out the holes drilled there. In this way the steam, or whatever, would spiral down from the edge to the center of each disc, turning them all with terrific force despite the fact that they carried no "buckets" or other protrusions. The first model, built in 1906, was six inches in its largest dimension, and reportedly developed thirty horsepower. Tesla hoped to develop his disc turbine into a money-making proposition, but for once he was too late. Turbine engines had been in development for years, and most of the problems with standard cup-and-vane turbines were either solved or on their way to solution. Tesla's turbine had no such history, and no one was interested in putting up with his authoritarian personality long enough to work out the problems. The main hurdle was that his turbine would spin so fast that the discs were damaged by the stresses at such speeds. Metallurgy has advanced in leaps and bounds since those days, but the incentive for an entirely new turbine still does not seem to exist.





Tesla also had invented a "valvular conduit" to feed air/fuel mixtures into his machines at the high speeds required for their operation. As a matter of fact, the faster the explosions of the air/fuel mixture occurred, the better his "valvular conduit", which had no moving parts, would work. Tesla took out patents on the turbine and conduit and he also took out patents for pumps and speedometers based on this principle.

> "Tesla has even been the subject of books claiming that he was from Venus and that he landed here in a flying saucer."

Here the record of Tesla's work ends. His work on the turbine was an on-again, off-again affair until about 1912 when he walked out of the Allis Chalmers Company labs because "They would not build the turbines as I wished." Incredibly, for the next thirty years Tesla would continue his mental experiments but would never have enough money to build models of his ideas. Without the models he could not patent the devices, and without patent protection he refused to disclose details of his ideas to anyone. Nor does any written record seem to remain to reveal what he was working on. All we have are sensational newspaper reports based on Tesla's periodic announcements to the press about some new generator or method of power distribution. Tesla never revealed any details to the press, either, and while reporters loved the copy his "wild" ideas provided, no one could be certain that anything he announced was even possible. This is still true today.

During this long time Tesla drifted from hotel to hotel as past bills accumulated. Whenever he was given any money, he would use it to pay off back debts from the Wardencliff project, or back wages to old laboratory assistants. The famous electrical engineer B.A. Behrend was a close friend of Tesla's and Behrend settled Tesla's back hotel bills several times while Tesla drifted from place to place, finally ending up at the Hotel New Yorker. Tesla never admitted any disappointment with his life, always hoping that someday he would have enough money to begin work again. Until that time came, he would patiently wait and continue his routine of taking long walks in the city and feeding huge flocks of pigeons in nearby parks. When he was seventy-five a special birthday celebration was given, at which he was presented with a book of letters from scientists and engineers all over the world, praising his work. A fund was started in Yugoslavia which provided a stipend of $7,200 per year for the rest of Tesla's life. A museum and institute were established in Belgrade, in which the notebooks and some of the equipment Tesla used are housed. In 1937, while out walking, Tesla was struck by a cab, but he refused to get treatment for his injury. He lay in his room for several months recuperating and when he finally recovered he resumed his walks, though less frequently. On January 8, 1943, a chambermaid found him dead in his room. Tesla had died alone at 85, virtually unknown, surrounded by a city whose life-blood of electricity flowed through the system he had created.

Tesla left no one to carry on his work. He had planned to write a definitive autobiography which was to give the full story of his work, but there is no indication that he ever began it. After his death his letters and papers were seized by the Custodian of Alien Property. The government in this case was probably looking for details of a "death ray" device — an idea for beamed DC power — which Tesla had announced to the press a few years previously. His personal papers were turned over to his nephew in Yugoslavia. The disposition of his other papers is not clear, although his Colorado Springs notebooks seem to have ended up in Belgrade also. There was a war on, and a very busy country soon forgot this lonely old man. As a result, one of America's greatest, and strangest, scientists became an obscure figure about whom odd tales are told.

Before he died, Tesla admitted that he may have been trying to act too soon in his attempts to establish his worldwide system of broadcasting "information and power". But, he noted, "Just as soon as the need arises . . . I have the system ready to be used with complete success." We need it now. If we can rediscover the methods Tesla employed, and if those methods prove useful, it just might happen. ■

Bibliography and Access

1. There are two major biographies about Tesla. The most accessible is:

John J. O'Neill, **Prodigal Genius**, 1944, David McKay Co., New York, N.Y., $3.45.

O'Neill was the Pulitzer Prize winning Science Editor of the Herald Tribune and he knew Tesla personally. This article is based upon his book, which I have found to be generally accurate, with a few exceptions. This is the best general biography including much material on Tesla's personal life and also on his inventions, but there is no bibliography or footnote material.

2. The most recent biography, but now out of print is:
Inez Hunt and Wanetta W. Draper, **Lightning in His Hand: The Life Story of Nikola Tesla**, 1964, Sage Books, Denver, Colorado.

Hunt and Draper have written several books about the West and this book is a major change for them. They have produced a good general popularization about Tesla. The book clarifies some points made by O'Neill and disputes others. It is well researched with a very good bibliography and should be read to round out the subject.

3. Thomas Cummerford Martin, **The Inventions, Researches, and Writings of Nikola Tesla**, 1894, *The Electrical Engineer*, a journal Martin edited. Out of print. Republished once in 1952 by the Lee Engineering Co., Milwaukee, Wisconsin, so that there should be copies in electrical engineering libraries. Includes Tesla's major lectures and many technical descriptions of Tesla's AC devices.

4. Tesla's lectures may also be found in: **Nikola Tesla — Lectures, Patents, Articles**, the Nikola Tesla Museum, Belgrade, Yugoslavia, 1956. The only source for this which I have found is Health Research, an outfit which reprints hundreds of books and articles on the subjects of the occult, astrology, flying saucers, etc. They reprint by offset on cheap paper and the photos are ruined. Also many of the line drawings are hard to decipher, but the words are all there. About 1,065 pages. Includes all of Tesla's major patents and many articles, including, "The Problem of Increasing Human Energy." $30.00. Health Research also lists the Martin book for $10.00. Write to: Health Research, P.O. Box 70, Mokelumne Hill, California, 95245, for a price list and ordering information.

A DISTURBING

BY IRA EINHORN

Ira Einhorn's letter flunks several standards for inclusion in a scientific journal but, happily, that is not what we're editing here.

The Soviet device he discusses at the beginning is real. The first long article I read about it came across the Reuter's wire last year and quoted Western intelligence sources who speculated that it was a test of over-the-horizon radar. For many reasons, this seems like a foolish explanation of whatever it is that the Russians are doing. Paul Brodeur's The Zapping of America, *reviewed by Alvin Duskin on p. 84 of this issue, suggests the true nature and the success of the small-scale mind-bending operations directed against the American embassy in Moscow as well as the State Department's complicity in covering up the affair.*

We'd like to see your responses to Ira's dire scenario. Interestingly, Ira doesn't reveal the name of the big corporation willing to help his informal network, nor shall we, except to say that she is like a mother to us all.

—LL

During the time that Alexandr Solzhenitsyn was making the transition from his native land to his fortress in New England, he uttered a prophetic statement about the third and fourth world wars. In essence, he said that the Russians had won the third world war and that the battle was now shifting from physical combat to the mind, for the fourth world war involved the struggle for the human mind itself.

This battle is raging, though few are aware of it. The present scientific edge of human thought is now deeply involved in concepts that force us to consider the idea of a human mind, as distinct from the hardware of the brain, in a serious fashion. The conceptual struggle is enormous. We must get the observer — as an influence, not just as a passive receiver — back into the equation.

This struggle within the ranks of accepted physics has been joined by those wrestling with the question of the "paranormal," which includes telepathy, precognition, psychokinesis, UFO's and many other well-attested, if still questioned, phenomena.

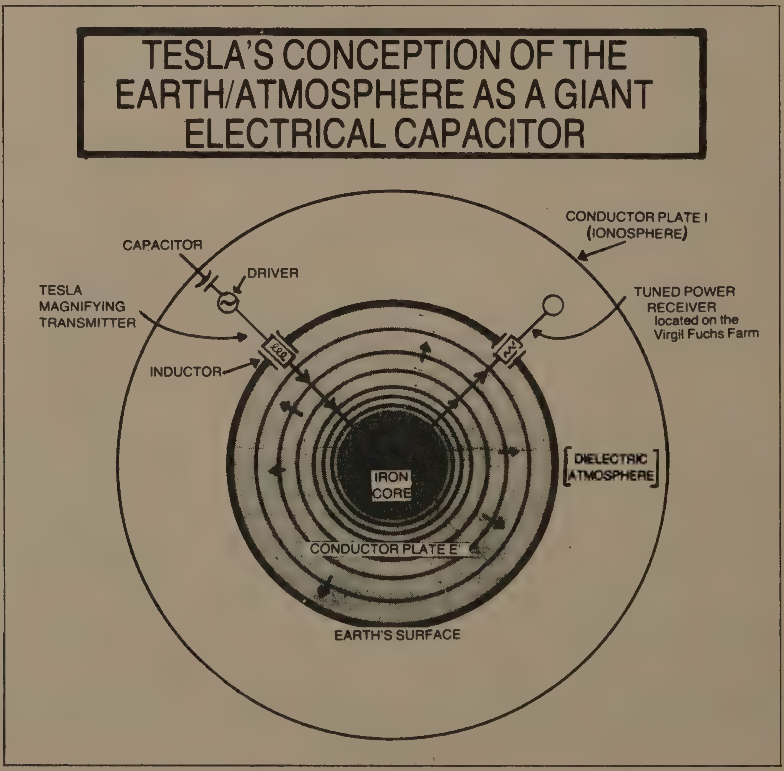
For the past seven years, I have run an international information network under a barter arrangement with one of the world's largest corporations. The network has dealt with information that addresses the interface between the edge of physics and the paranormal. Information is now flowing to and from 20 countries on a regular basis.

In the last two years, the ideas of Nikola Tesla have assumed increasing prominence in the minds of many who are involved in the network. One prominent member of the network, who was considering Tesla's ideas on the wireless transmission of electricity as demonstrated in Colorado in 1897, suddenly realized that the Russian device that had been interrupting all forms of electromagnetic communication on a planetary basis was a Tesla magnifying transmitter.

After a careful analysis of the harmonics of the transmissions which were producing the disturbances, he came to the conclusion that the Russians were using two Tesla magnifying transmitters, located at Riga and Gomel, to broadcast electromagnetic waves through the earth at frequencies in the alpha waves of the human brain. (Alpha frequencies are 7-13 Hertz; 1 Hz = 1 cycle/second.) This is a frequency range to which the earth is transparent, thus the signal goes from point to point without any loss in power. In fact, Tesla claimed that if the magnifying transmitter was pumped up to a very high voltage (100,000,000 volts) there would be an actual increase in power during the transmission.

Substantiation for my colleague's suspicions began to pile up as various members of the network began to report unusual occurrences in Canada. The following is a paraphrase of one report given to me over the phone by a friend who works in the Canadian Department of State. I'm quoting from my daily diary, 3/18/77:

"In Toronto on March 15 (3-10 p.m.) the entire AM & FM radio spectrum was blotted out, for periods of 1-8 seconds, from time to time. These interruptions were accompanied by


TESLA'S CONCEPTION OF THE EARTH/ATMOSPHERE AS A GIANT ELECTRICAL CAPACITOR

COMMUNIQUE...

sheet lightning of a blue mercury-lamp incandescence, high in the sky. The lightning was moving in a circular, clockwise path.

"The same phenomena were reported in Ottawa from 9 - 2:30 a.m. There were similar but less intense occurrences in Timmons, Ontario and Ottawa the two previous Saturdays: the entire AM & FM spectrum was cancelled out at times, and radio amateurs were often totally blotted out.

"People who would be classified as being psychically sensitive felt very acute pains in their frontal lobes. These reported effects on human beings have been corroborated by internal investigation of the Mounties on their own personnel. (More than 80 per cent of the Mounties interviewed expressed similar physical problems. They were asked to describe their physical state during a time of suspected Russian broadcasting without being told why.) The Mounties then did some careful surveying of the general population and came up with similar results."

All of this information should not come as a surprise to those who have been following the released Russian data in fields related to parapsychology.

The front-page New York *Times* article by Flora Lewis, published this summer after the arrest of Los Angeles *Times* reporter Robert Toth in Russia for allegedly receiving parapsychological information, touched upon vast secret Russian laboratories and large amounts of money being spent in an attempt to understand the paranormal.

Small bits of data either openly published or leaked to me by scientists interested in preventing a psychic Pearl Harbor indicate a growing Russian success in the development of psychotronic weapons.

Recall the Russian microwave bombardment of our embassy in Moscow (extensively reported throughout the world in the press and brilliantly documented and put into context by two *New Yorker* articles published in December, 1976, which are now published in expanded form as *The Zapping of America* by Paul Brodeur, Norton, 1977) and think of it in connection with this experiment reported on both in *The Journal of Paraphysics* and *The Journal of Psychoenergetic Systems*:

One cell colony hermetically sealed off from another is irradiated with disease. No disease is noticed in the colony that has not been irradiated. However, if the same experiment is repeated with the two colonies separated by a quartz crystal that allows ultraviolet waves to pass from one colony to the other, the second cell colony soon develops the disease that has been given to the first. The implications of these experiments are that electromagnetic waves can be used as a carrier wave for all kinds of previously unimagined information, including disease.

With these facts in mind, let us continue the tale of the Tesla magnifying transmitter and the Russians.

The particular suspected effects on the human mind of the transmissions from the two Russian transmitters became very real to me in the spring of 1977 when two scientific friends built a small-scale model of the suspected Russian device and tested it on their own acquaintances.

The plans to build such a device came into the hands of my friends in a rather unusual way. When Tesla died on January 7, 1943, the FBI confiscated papers found in a wall-safe in his room. An agent held back some of the information, which later was given to an associate of one of the men who built the scale model.

The tests, carried out with the scale model, were devastating. The device would entrain with and then drive the brain waves (within 3 - 5 seconds) of anyone it was directed towards. No known shielding could prevent the device from operating. The effects produced were very frequency-sensitive. Depending upon the output of the small transmitter, you could produce sleep, pain, nausea or euphoria.

Armed with this information, the network of concerned people set out to inform the American and Canadian governments. The response of the American government was a total stone wall, backed up by death threats, spying, harrassment and an idiotic classifying of every document concerning Tesla that was sent them. The response indicated that we had stumbled upon something important. After six months of frustrating response, a decision was made to write a book. The entire story, backed up by extremely careful documentation, will be published in 1978.

The Canadian government have been less paranoid in their responses, and there are indications of their willingness to share data and pursue the more peaceful uses of the magnifying transmitter. However, when it comes to any public dealing with the issue, they are totally hamstrung by their relations to our own National Security Agency.

It is worth relating a few other incidents that somewhat flesh out the bare bones of my suppositions.

In March of 1977, while I was in the midst of the Tesla situation, I received a call from a friend who works for one of our largest aerospace companies. He was in pursuit of information that dealt with the supposed instant translocation of a Navy ship from Philadelphia to Newport News, VA, in 1943. A co-worker had read a then top secret document, describing the incident of translocation, while he was in the service. He brought up the incident at a staff meeting and had evinced immediate interest from his boss, who was undergoing a series of synchronistic incidents that were generating intense curiosity about the technological possibilities of the paranormal.

I quickly located a document in the UFO literature that indicated such an event had transpired. After months of conversations with various representatives of the aerospace company, it became clear that the ship had been translocated during attempts to produce target invisibility, in order to provide safety from *kamikaze* attacks. Everyone suspected that the devices used to produce such an effect were the offshoots of the papers confiscated on the death of Tesla.

At about this time, the Tesla museum in Belgrade (where most of his extant papers, still largely unpublished, are stored) closed.

Another aspect of the magnifying transmitter's effect is its suspected ability to modify the weather. This has been hinted at in a few newspaper articles, but is very difficult to prove.

Thus, I was extremely amused by two facts which I gathered during the last three months.

While in London in the summer of 1977, a friend and I briefed one of England's top physicists on a number of aspects of the suspected Russian doings. He immediately went to his War Ministry friends and reported back to us that the Russians were doing ionization experiments. Once back in this country, I was questioning one of my aerospace industry friends on the nature of our scientific theorizing on the extremely unusual present weather patterns. He replied that our National Center for Atmospheric Research in Colorado was leaning toward explaining a lot of the changes by a strange shift in ionization patterns.

The New York City power blackout was accompanied by a Mexico City blackout and a power outage in Los Angeles, lasting minutes. Some scientists feel that the magnifying transmitter is responsible, for the data indicate that the Russians were doing some heavy broadcasting during the night of July 13.

All of these incidents could be unrelated. I doubt that this is so. A pattern is emerging that informed citizens must become aware of.

The Tesla device uses technology that one versed in electromagnetism can understand.

Many other reports from all over the world indicate that an utterly new psychotronic technology, utilizing principles that defy presently accepted scientific models of reality, is quickly being developed.

Here is a schematic of a system that indicates how one would modulate an electromagnetic frequency to deliver disease from a great distance without anyone being able to detect anything but the end product: the disease itself. The Tesla magnifying transmitter could be used for point-to-point transmission almost anyplace in the world. Some people in my network are looking at the still-to-be-explained Legionnaire's Disease from this point of view, especially since the recent outbursts appear to fall on a grid pattern that relates to the placement of the two supposed Russian devices.

Recent verbal reports from a number of people in the intelligence community lead me to believe that Our Side has a large Tesla magnifying transmitter operating out of New Zealand. An incident reported in the New York *Times* on September 23, 1977, via Tass and the AP (Moscow) gives circumstantial support to the assertion. "A mass of light appeared in the skies of Petrozavodsk in Soviet Karelia and 'hovered in the form of a jelly sending down a multitude of fine beams. The impression was of a torrential rain of light.' " *Et tu Brute!*

The irony of the present situation was exponentially increased as I listened, two nights ago, to Daniel Ellsberg's story of his own personal grappling with the nuclear weapons issue, and realized what a difficult road the nuclear opposition had to tread.

Time has quickened and the ultimate manipulation is facing us. The manipulation of human consciousness itself. 1984 has arrived a bit early. Only extreme openness and deep sharing of data can hope to combat what our leaders have in store for us.

—Ira Einhorn
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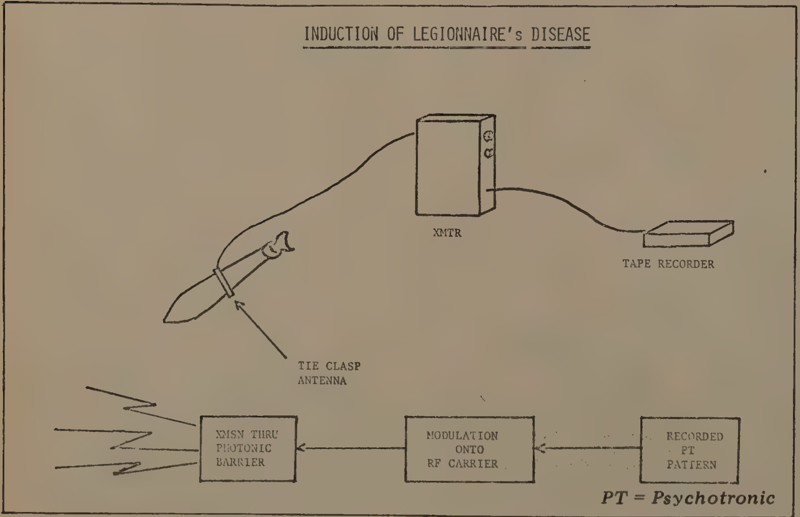
Philadelphia, PA
19104


INDUCTION OF LEGIONNAIRE's DISEASE
XMTR
TAPE RECORDER
TIE CLASP ANTENNA
XMSN THRU PHOTONIC BARRIER
MODULATION ONTO RF CARRIER
RECORDED PT PATTERN
PT = Psychotronic

AND

The status of Tesla's ideas today is a bit disturbing. Whether any, many or all of Ira Einhorn's suspicions are ratified by the facts, it is plain that most of the ongoing research into Tesla's private universe is happening in laboratories run or funded by intelligence and military organizations. The Air Force, Lockheed, Einhorn's naughty commies. On the other hand you have the contingent willing to entertain the theory that Tesla was an extraterrestrial posing as a Yugoslavian, a latter-day Prometheus whose notebooks, if aptly deciphered, will retrieve the theory of the luminiferous ether from the darkness whence Einstein banished it.

It would be nice if some serious electrical engineers and physicists somewhere got some money and a set of Tesla's notebooks and patent papers. Nice, as well, not to have people in uniforms asking you to vanish a battleship or make everyone in Cleveland vomit at the push of a button.

Fortunately, some work is beginning to sprout here and there. A coil at the University of Texas at Austin. After-hours work by scientists at Hydro Quebec's big laboratories in Montreal.

The most fascinating experiment is one designed and, now, largely constructed by a group of Tesla devotees in Canada. Only ten or so people are involved, none full-time. They have learned to dislike publicity because something about Tesla attracts kookaboos who can waste a lot of one's time. Accordingly, Tim Richardson, leader of the group, asked **CQ** not to publish his precise location in Ontario or even the name the group calls itself. (Serious inquiries may be channeled towards their Toronto solicitor, Michael Hardy, whose address appears below.)

Richardson's interest in Tesla dates back to his childhood in the United States when a friend of the family, Igor Sikorsky, the inventor of the helicopter, talked to him a great deal about Tesla and his ideas. Richardson grew up, began to study electrical engineering and then left school for direct experimental work on the Tesla patent papers and available notebooks.

When he began, he had the feeling that others in the field say that they have shared, the belief that someone, somewhere must have gone to the trouble before. If so, they have not published.

"What we're trying to do is to tie Tesla's work down in terms of standard engineering," Richardson explains. Bud Spurgeon's biograph-

A HOPEFUL ONE

BY LARRY LEE

ical sketch of Tesla described the inventor's maddening habit of begging the question whenever theorists asked for the numbers behind a device functioning before their eyes. Tesla's notebooks and sketches are full of machines which have no conventional reason to produce the effect Tesla predicts. "When you get to the part where there's a great leap in thinking," Richardson says, "you turn on the machine." He and his colleagues are building Tesla devices from the master's own plans and using them as suggested.

The Tesla papers are full of energy collection and transmission devices, and the whole range of his ideas fascinates Richardson, his nine colleagues and their large informal resource pool. So far, the best-publicized aspect of their work is a plan to transmit power from a site in Ontario to a farm in Minnesota. The sending and receiving coils, built according to Tesla blueprints, are in place on both sides of the border. The Canada-to-Minnesota test will follow small-scale experiments between nearby coils in Canada. (Richardson and his colleagues are concerned about ground-wave effects and RF interference. Something about Tesla makes one want to think things out thoroughly before pulling the switch.)

On the receiving end of the power-across-the-border experiment is a Minnesota group battling plans for a huge power line, a DC system to carry electricity from plants near coal deposits in North Dakota to Minneapolis-St. Paul. The Rural Electrification Administration is involved, but opponents point out that it's city power at stake here, and the farmers complain that the big towers will interfere with the pivot irrigation systems which work best on the plains of the upper midwest.

Will Mische, leader of People's Power Project, learned of Tesla through a gee-whiz Sunday piece in the Washington **Star** by Stephen Ogg.

"I couldn't believe Ogg's article," Mische says. "I thought I was well-read, but I hadn't heard of Tesla before the article, and the article tempted me to say there was something kooky about Tesla." Mische, who believed that wireless transmission of power was the answer for Minnesota, checked all the college libraries in St. Cloud and found nothing substantive. Finally, at the EE department of the University of Minnesota, he found a volume of Tesla patent articles and lectures. He spent two weeks tracking through the Reader's Guide all the way back to 1885, decided Tesla was for real and told the farmers.

Soon, Mische was in contact with Richardson's group, and the plan was devised to transmit electricity more than 700 miles from a site in Ontario to the farm of Virgil Fuchs in Elrose County, MN. (The receiving station is on a farm near Belgrade, MN, a site chosen before Mische knew that Tesla hailed from Belgrade.)

Along the way, there was an attempt to get Minnesota Governor Rudy Perpich to set up a Tesla task-force. Perpich, who is of Yugoslavian ancestry, knew of Tesla as a notable countryman, but has chosen to pursue his own notion of creating a state science court to decide the power-line disputes and others like it.

The transmission experiments, which duplicate Tesla's work in Colorado Springs, should be underway no later than early 1978. Richardson and his colleagues are thinking about a Tesla newsletter, and Hydro Quebec is pondering a 1978 symposium on Tesla's theories.

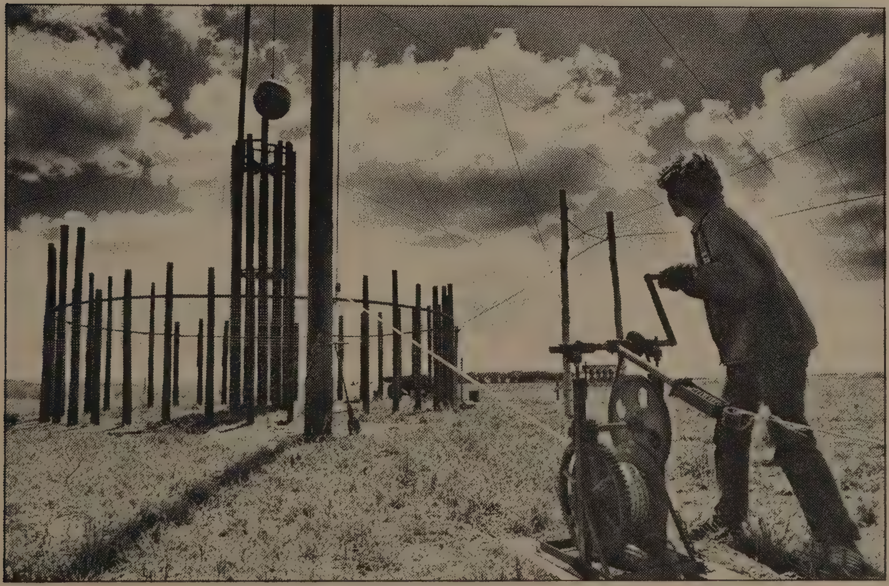
In California, psi-physicists interested in subjects such as standing waves between planets and forces behind the old theory of ley-lines (what the Chinese called geomancy) are designing experiments along Tesla principles.

If Tesla was ahead of his time, perhaps it was only by a hundred years, give or take a few.

Neither Mische nor Richardson has the time or resources to answer casual correspondence on the subject, but serious inquiries or contributions to the process may be addressed to:

Will Mische (Peoples Power Project)
507 Seventh Avenue, North
St. Cloud, MN 56301

Michael Hardy (Richardson
working group)
Suite 421
131 Bloor St. West
Toronto, Ontario Canada M5S152 ■



Mike Knaak

Steven Fuchs, son of power line opponent Virgil Fuchs, cranks a winch lowering the aluminum ball over the Tesla Coil, an experiment in the wireless transmission of electricity, on a farm near Elrosa, Minnesota.

from THE THIRD MIND

by William S. Burroughs

Look back at your book of Egyptian hieroglyphs. Just here is a boy sitting down. Now, instead of the stylized glyph, suppose we had a painting of a boy which would logically lead to painting others (and some of them would be doing more than just sitting down in my army) or, here, is a plough; well, now, I can see a plough in the window of Sterner's Hardware Store. . . "that Jew in Cold Spring charges too much for fence wire". . . and I can see bronze ploughs in museums and I can see these ploughs in action, turning up great fields of corn and young farm-boys, too, in the old outhouse, doing what boys will do, so charge it all up to fertility rites, and here is, "to pour out water, to micturate,". . .hmm, looks to me like he's pouring out more than water and that brings up some pretty pictures.

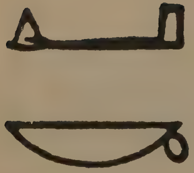
So, you see, I take a picture which stands for and, by God, is a word and it just naturally opens itself out, feeling for other pictures. . . doing what pictures will do. Just let the words dissolve in the picture. Why listen to one house when you can see all the houses? So my words just disintegrate into a Gysin picture. . .

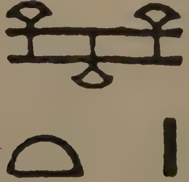
I don't know if Mr. Graham Greene is going to like this, but he has his place in the garden along with Truman Capote. . . music across the golf course echoes from high cool corners of the dining room, a queer little breeze flutters candles on the table and swishes away down those dead dead days. Now, that could just swish away calligraphic like mice, that swish. . . what? Who let them in? Let's let them out.

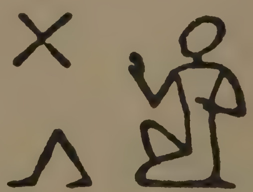
Now, here is a fucking glyph for you; character pouring water over his-self: the 'Priest' they called him. A sick old junky pouring water over his-self? Blood of Christ, where they made the atom bomb I went to school. . . saw some boys: glyph No. 90, in: "Members of the body." What is masculine glyph No. 94; male organs. Glyph No. 74, to receive: glyph No. 92, to hold in the hand and glyph No. 93, Sir E.A. Wallis Budge refuses to translate but we get the general idea. . . And, just here, is Time as king Tut saw it. . . remember, "I'd rather be a mummy"?. . .

Second, we have here on screen some dried poppy pods, a hawk, the sun and a skull cap; near as I can make it out from this remote landing. Well, an old junky, in off the parched plains of Kansas, ate the poppy pods and got relief. . . The hawk circles in the shattered blue sky over Mexico. . . the skull cap is still there. . . Minutes later, we have here a boxer dog, a skull cap and the sun. Now, that boxer dog was called, "Shane," and he was called in to lick a girl out of her coma, I read about it only today in the Daily Mail, for June 29. Her father said: "I pray that Shane will help her get better". . . Well now, I wouldn't want to see too much sunlight on a thing like that. Is one expected to remove one's skull cap?

Hour: Well, here we got a hare setting down, some nice blue water, a jar, the sun and a roll of film negative. . . The hare went thataway. A film boy stripped his-self naked, filled the jar with water from a blue river. . . magic of all movies is remembered, kid standing there poured the water over himself and jacked off into his skull cap. So, left an old junky selling Christmas seals on North Clark St. Yes, there's the boy and there's the blue river. Remember the song? Yes, I can see all the abandoned country clubs and weed-grown golf courses, a thousand lost skull caps (red mostly) see the boys spitting blood in the violet evening sky over Lima. . . Fight tuberculosis, folks. . . An old junky on North Clark St. selling Christmas seals used to be me. Mister, remember the caddy, shirt open on the golf







course? you'll find him there by the Blue River when the wind is right. And remember the old junky on North Clark St.? The Priest, they called him. Used to be me, Mister. . . cold blue alleys of Chicago. . . Lake wind like a knife. . . Pour water on a sick old junky. . . Sacred Blood of Christ, you son of a puta. . . And here is a picture from Spain. . . the abandoned railroad. . . tunnel in the iron rock. . . weeds in front of the tunnel. . . two boys in there. . . I see some white gobs. . . boys on a long gray beach with dusky rose-colored genitals, anchors on the beach. . . all the old blue calendar pictures over here. . .

Now, as to how to present it on a page and how to indicate just where I am in the pictures when I write what. . . this poses a problem. Unless the picture just lights up when you press a button. What I mean is: why not extend our, uh, analogy mapping psychic areas and give precise coordinate points subject of course, to change without notice as when Clark St. shifts from one picture to the other the way an old street will. . . And, maybe, the next time I pass the tunnel those boys won't be there. . . just winds of Spain stirring the weeds in front of the tunnel. . . so, refer you to, The Book of the Dead. . . "Field of grasshoppers. . . bushes. . . the olive tree is my name. North of the bushes, did you see there the leg and the thigh?" . . . Washed back on Spain, 'Repeat Performance' page. . . Maybe it wasn't just hash Hassan-i-Sabbah picked up on in Egypt. What about the glyphs talking over distances in silence?

Here is the progression: Words, glyphs, drawing or painting expansion of the glyphs into a Gysin picture or, you can do the same, of course, with any photo proliferating virus-wise, the way any old photo will. . . And, inasmuch as any vision and especially the vision of an artist presents itself in the form of an image — preferably a youth of blinding beauty. . . such frivolous neural patters having been, of course, installed by the Word & Image Mob who now stand there with their bare image hanging out and say:

"You can't beat it. Image is real. Virus is real. There is nothing but virus!"

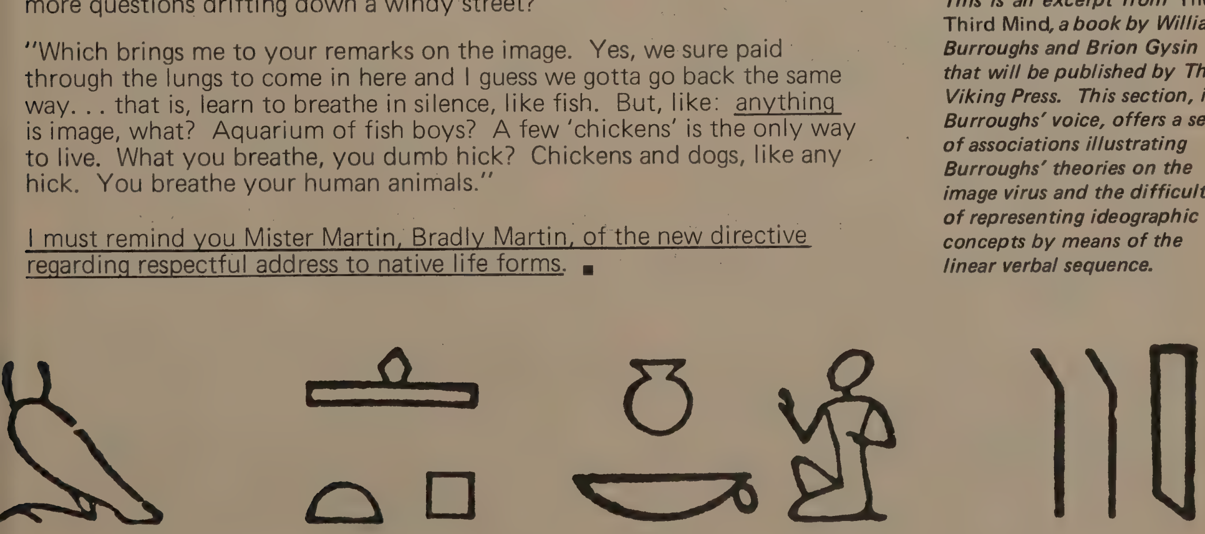
I can only reply:

"Gentlemen, the virus is an ugly picture looking for a mirror with understandable but absolute need. I don't care how good the picture looks to start with — when it experiences the absolute need that any image organism must experience when image is withdrawn, it becomes a very ugly picture, indeed. And. . . the uglier you are, the steadier you score. "The Silver Sore" we call it. . . just junkies, frayed old film. 'Brother, can you spare a bright silver dime?' And, let me warn you young officers, especially: a virus is never more dangerous than when on the mooch. . . and they always are. Reluctantly, we vote to view any virus with armed alertness. Any more questions drifting down a windy street?

"Which brings me to your remarks on the image. Yes, we sure paid through the lungs to come in here and I guess we gotta go back the same way. . . that is, learn to breathe in silence, like fish. But, like: anything is image, what? Aquarium of fish boys? A few 'chickens' is the only way to live. What you breathe, you dumb hick? Chickens and dogs, like any hick. You breathe your human animals."

I must remind you Mister Martin, Bradly Martin, of the new directive regarding respectful address to native life forms. ■

This is an excerpt from The Third Mind, *a book by William S. Burroughs and Brion Gysin that will be published by The Viking Press. This section, in Burroughs' voice, offers a series of associations illustrating Burroughs' theories on the image virus and the difficulty of representing ideographic concepts by means of the linear verbal sequence.*



Carol Kramer

The Priest, the Well and the Pendulum

by Jacques Vallee

Jacques Vallee is a French-born astronomer who became an information theorist. He works with two think-tanks on the San Francisco Peninsula, including Infomedia Corporation, of which he is president.

To the general public, he is best-known for his books on UFO phenomena. His most recent, The Invisible College *(Dutton, 1977), is named for the group of men and women, most of them scientists, who have formed a quiet committee of correspondence to deal with the subject in non-traditional ways. "Non-traditional" in Vallee's case means a phenomenological approach: toss out all the wishes and fears we pin on UFO's and look hard at what people who say they have experienced UFO's say they have experienced, not just the parts of their stories which fit a logical preconception. Although Vallee offers no final answers, his is one of the few analyses to accommodate the absurdity and contradictions many UFO reports contain.*

In the new movie Close Encounters of the Third Kind *the character Lacombe, played by Francois Truffaut, is based upon Vallee, who implored director Steven Spielberg in vain not to present the world with another gang of kindly UFO visitors from outer space. (Vallee is taller than Truffaut and speaks excellent English without an interpreter.) "I think they were simply looking for a character at a level of strangeness halfway between the main characters and the space people," he explains. (It's interesting to note that the alien Coneheads of NBC's* Saturday Night *identify themselves as French when pressed about their origins.)*

Vallee's notes here deal with a classic problem in information theory and some well-documented phenomena current models of information cannot accommodate. They suggest a form of broadcast few can receive. As yet.

—LL

We are in the little town of Prangins, in Switzerland, in January, 1929. The mayor has called a geological expert to solve a severe water shortage. The expert states that the only source available is 4 kilometers away, at the foot of the Jura mountain. Special installations and an aqueduct will have to be constructed at great expense. Before going ahead, the mayor agrees to consult a local priest, Abbe Mermet, whose reputation as a gifted water-diviner is well established. The good Abbe goes to the Prangin city hall, observes the motions of his pendulum, and states that the proposed aqueduct is unnecessary: in the village itself there is an underground current, he says. It can be tapped at less than 4m depth and will yield 800 liters per minute. The skeptics laugh and the experts complain, but the town goes ahead with a test well. It finds water at 3.5 meters and 800 liters/minute, at the location indicated by the priest.

Over the years, Abbe Mermet conducted hundreds of successful searches either in the field or from maps, locating water, oil, mineral resources, caves and missing persons. How was this information obtained? By what physical mechanism was it transmitted and deciphered? What consequences could a model of such processes have for our understanding of physics?

The frequent occurrence of such cases points to undiscovered relationships between physical reality and human consciousness; it can be used to clarify some exciting theoretical and practical opportunities regarding the concepts of energy and information.

According to modern physics, and in particular to Brillouin, Grabor and Rothstein, information and entropy are closely related. The relationship has been expressed clearly by Brillouin (in "Science et Théorie de l'Information," Paris: Masson 1959, p. 155):

> Entropy *is generally regarded as expressing the state of disorder of a physical system. More precisely, one can say that entropy measures the lack of information concerning the true structure of the system.*

No information can be obtained in the course of a physical measurement, then, without a corresponding variation of entropy in the universe, a change in the state of disorder of the cosmos.

Now the physicist is faced with a new challenge: how to define disorder. And the task, as R. Schafroth has pointed out ("selected lectures in modern physics," London: Macmillan, 1960, p. 268) is not easy:

> *Some scientists pile up papers and books on their shelves in apparent disorder, yet they know perfectly how to find the document they want. If someone restores the appearance of order, the unfortunate owner of these documents may be unable to locate anything. In this case it is obvious that the apparent disorder was in fact order, and vice-versa.*

Speculating upon the relationship between these physical quantities, Costa de Beauregard wrote ("le Second Principe de la Science du Temps," Paris: Seuil 1963, p. 69):

> *It must be in the nature of probability to serve as the* operational *link between objective and subjective, between matter and psychism.*

Costa de Beauregard points out that in pre-cybernetic physics, *observation* was regarded as "a process without mystery, requiring no explanation" while *free action*, on the contrary, was "regarded as a physical impossibility and a psychological illusion." In modern physics these ideas have been revolutionized.

The key to these notions might be sought in cybernetics, but no serious attempt has been made to fit it to the lock. Information theory deals exclusively with the transmission of "messages" regarded as physical quantities (impulses sent along a wire or bits stored in a magnetic device). What about the "meaning" of that information to the sender and the receiver? If you play a tape of Beethoven's Ninth forward and then backward (as suggested by Abraham Moles in "Théorie de l'Information et Perception Esthetique" – Paris: Flammarion 1958) you are releasing precisely the same quantity of semantic information, but is the esthetic information identical?

Researchers of psychic phenomena (such as Abbe Mermet's abilities with a pendulum, or the remote viewing demonstrated by Ingo Swann) have the opportunity to extend the observations and the theory of information. Unfortunately, most of their speculation remains prisoner of obsolete models of communication.

Abbe Mermet, himself, argued tentatively that "radiesthesic rays resemble very much other invisible rays, infra-red and ultra-violet" to explain the fact that "distance has no influence in the action which remote bodies exert on the sensitive and his pendulum." However, his book, "Comment j'opere," was published in 1935, at a time when one could be excused for thinking that this comparison was appropriate. In recent years, researchers have continued to look for similar models. The Soviet literature of psychic phenomena has stressed the concept of the subject as "receiver," and the experimenter as "transmitter" or vice versa, assuming that classical information theory should be applicable to psychic functioning. Recent research is more sophisticated and is beginning to use the specialization of both sides of the brain to explain aspects of the experiments where "esthetic information" (to use Moles' terminology) seems to be received but where "semantic information" translatable into precise words is missing. This right brain model of psychic functioning, however, runs into serious trouble almost immediately, and so does the concept of psychic communication in a classical information framework – whether one assumes that the physical support of the information is found in photons or in more exotic denizens of the physicist's zoo: neutrinos, tachyons and the like (Puthoff and Targ: MINDREACH, New York, 1977).

The data from psychic experiments suggests a different approach. The subjects in the SRI "remote viewing" work may have been able to describe targets in drawings better than in words (suggesting a right brain function) but they performed equally well when they knew someone at the site or when they were simply given a set of coordinates, exhibiting what would seem to be left hemisphere activity in the latter case. Similarly, in remote viewing experiments I organized using a computer network as the support for the communication (Proc. IEEE, October 1976, p. 1551), there was no difference between the results of tests with open targets (telepathy) and double blind targets (remote viewing). Could such experiments, repeated on a proper scale, lead to a revision of the idea that psychic phenomena involve either radio-like, brain-to-brain communication, or information sending supported by wave propagation between a physical object and a sensitive's brain?

Abbe Mermet's own experiments indicate a much more subtle process. For example, it seems that he developed the ability to *interrogate* the pendulum in a way which is reminiscent of a user interacting with data-base software:

In October 1933, in Montbavon (Switzerland) an 18-year old man had disappeared as he came back from the village Fair. Many search parties looked for him unsuccessfully for nine days. His sister came to Abbe Mermet with a photograph of the boy and a piece of clothing:

> *"I gave to this person the following informations, said the Abbe: first, the photograph gives me the number of death. Your brother is no longer alive. He has followed such and such a path and stopped at such a place (witnesses were later found to verify this fact). At this spot I feel that your brother, height 1.55m (which was true) was carried, as a corpse, by another man, height 1.70m. He appears to have received blows in the back, at the level of the heart, and from here he is thrown into the precipice next to the road. He must be at this place in the Hongrin creek, at a spot where the depth of water is 4m.*
>
> *Was robbery the motive?*
>
> *Possibly, said the priest as he used the pendulum over the map. I feel neither gold nor silver around the body, yet you said that he was carrying some money.*

The body was found shortly thereafter. An autopsy revealed that the boy had been attacked with a knife, then thrown into the water. His purse was empty.

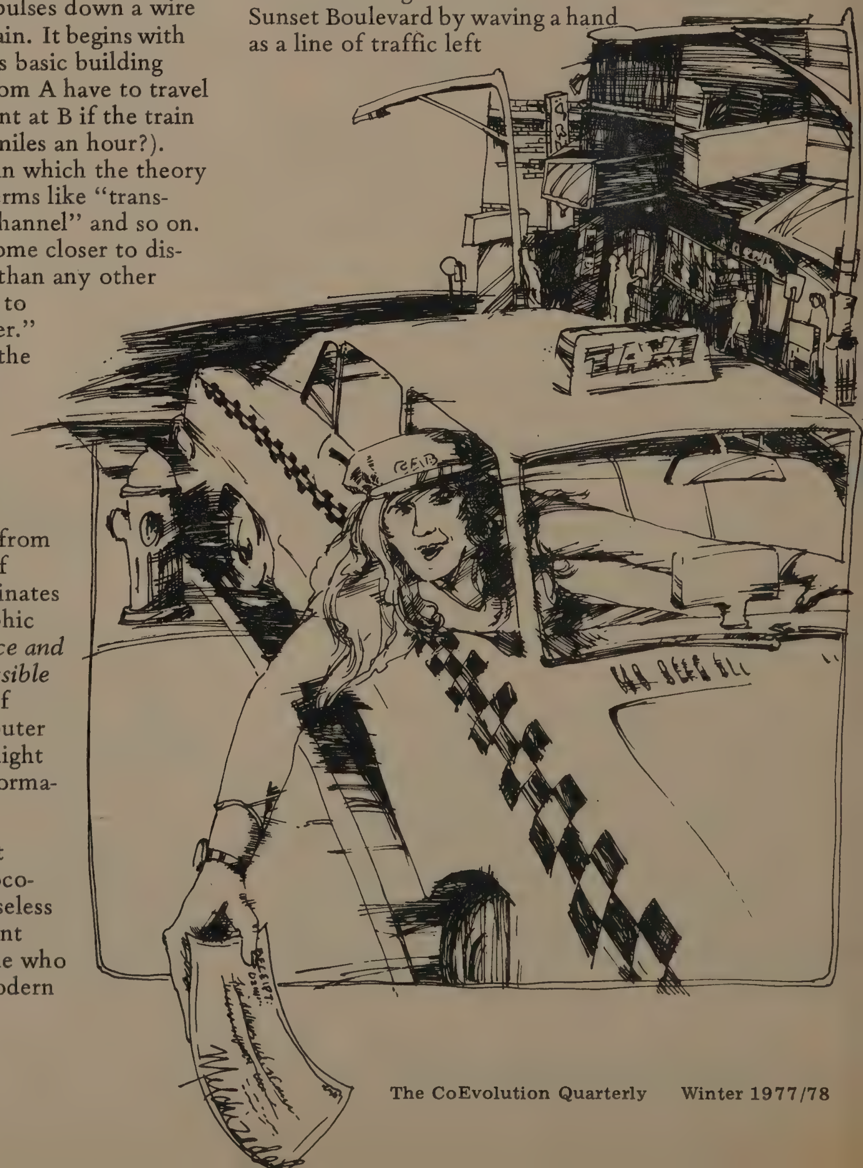
A basic problem may lie in the basic concepts of communication. As sophisticated as its modern applications are, the theory is still pegged to the days when railroad signalmen had to send impulses down a wire to trigger a switch ahead of some train. It begins with the notions of time and space as its basic building blocks (how fast does the signal from A have to travel along the wire to prevent derailment at B if the train left an hour ago and travels at 90 miles an hour?). This is reflected in the very terms in which the theory is expressed, nineteenth century terms like "transmission," "receiver," "sender," "channel" and so on. In psychic experiments – which come closer to displaying the nature of information than any other physical situation, I defy anybody to label the "sender" and the "receiver." When Abbe Mermet was directing the digging of a well to find water at a particular spot, or describing the location of the body of a person who had been murdered, was he "sending" or "receiving?"

I submit that it is proper to shake from our theoretical ankles the chains of space/time. Space and time coordinates derive their convenience from graphic considerations. *The theory of space and time is a cultural artifact made possible by the invention of graph paper.* If man had invented the digital computer before inventing graph paper we might have a very different theory of information today.

Time and space may be convenient notions to plot the progress of a locomotive, but they are completely useless to locate information. The apparent exception is the library, but anyone who has tried to find something in a modern library with its flat shelves along vertical walls will recognize Schafroth's predicament in telling order from disorder.

What modern computer scientists have now recognized is that ordering by time and space is the worst possible way to store data. In a large computer-based information system, no attempt is made to place related records in sequential physical locations. It is much more convenient to sprinkle the records throughout storage as they arrive, and to construct an algorithm for retrieval based on some type of keyword or on "hashing," a procedure where the record index is randomized. (Here again, probability serves as the link between something objective, the record location, and something subjective, the request for retrieval.)

An incident that I experienced on 21 February 1976 suggested to me that the world might be organized more like a randomized data base than a sequential library. I had spent most my spare time in the week preceding the incident gathering documentation about a historical figure related to some modern religious groups. The character in question was Melchizedek. I found out that there was mention of him in the Bible, and that at least two major heresies had been inspired by him during the Christian era. Then I set aside my notes and flew to Los Angeles where I had several meetings to attend. I called a cab on Sunset Boulevard by waving a hand as a line of traffic left



at the green light. A taxi moved out of the mass of cars and stopped. It was driven by a lady who took me to my appointment on la Cienega Boulevard and gave me a receipt. The shock came the next day when I took the receipt from my wallet to compile an expense report: It was signed Melchizedek. Since there is only one person named Melchizedek in the L.A. phone book, I have to conclude that mere coincidence cannot explain this incident. Alternative explanations are equally inadequate, unfortunately. There could be a well-organized conspiracy against me, of course, to put lady taxi drivers on my path with names related to my current reading interests, but the motivations of such conspirators would be rather obscure! Fortunately, another avenue of explanation exists:

If there is no time dimension as we usually assume there is, we may be traversing events by *association*. Modern computers retrieve information associatively. You "evoke" the desired records by using keywords, words of power: you request the intersection of "microwave" and "headache" and you find twenty articles you never suspected existed. Perhaps I had unconsciously posted such a request on some psychic bulletin board with the keyword "Melchizedek." If we live in the associative universe of the software scientist rather than the sequential universe of the space-time physicist, then miracles are no longer irrational events. The philosophy we could derive would be closer to Islamic "Occasionalism" than to the cartesian or newtonian universe. And a new theory of information would have to be built.

If energy and information are related, why do we only have one Physics, the Physics of Energy? Where is the Physics of Information? Is the old theory of Magic relevant here? Are the writings of Paracelsus, with his concept of "signatures," an important source of inspiration? These are highly speculative questions. But at a time when we are beginning to suspect that computer-based network communication may create altered states conducive to enhanced psychic functioning, a new type of physical experiments are becoming possible and creative speculation is necessary. These experiments would aim at probing the reality of information-handling by the brain from the point of view of associative constructs. They would ignore space and time referents to use instead an expanded view of the process in terms of retrieval systems. The SRI experiments with Swann and Price, for example, suggest that remote viewing is based on an addressing scheme. Is indirect and virtual addressing possible, and if so, to what level?

Is it possible to promote coincidences and peculiar effects (of apparently "paranormal" nature) by systematically creating physical structures serving as information singularities? Until these questions are explored, it may be impossible to address what Costa de Beauregard calls "the truly fundamental problem," that of the relationship between psyche and matter. For even if we only consider the operational aspects of an information, if someone learns something from it, physical theory dictates that the entropy of the universe must have changed. ■

et cetera

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— Anne Herbert

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It would be my judgment that without the existence of cultural choice among old or new, domestic or foreign, the kind of "closed minds" which we today call fanaticism, would not exist. Fanaticism is, however, a continuing possibility where there is choice, both among those who cling to the old in the face of the new, and those who become the dedicated proponents of change. Furthermore, it is necessary, of course, that the choice between old and new forms be a conscious one, not merely a slight change which is viewed as an emerging eccentricity of a particular group.

In societies with only an oral tradition, it is possible to have almost continuous change — like the perpetual re-editing of a sacred text — For example, if two instances of some hitherto unrecognized form of polygamy — such as a man marrying a mother and her daughter — occurred in the same hamlet among the Arapesh of New Guinea, the rest of the language group might shrug their shoulders and say, "That is becoming the custom in Ahalesmihi."

—Margaret Mead

Cultural Correspondence

Analysis of the prospect truly before us: polkas, nurse novels, TV commercials, drag-racing. The latest issue in hand contains a roundtable in which four leading underground cartoonists (Griffith, Kinney, Green, Crumb) answer questions no one else ever thought to ask them. In future issues: sex, architecture, everyday speech.

—LL

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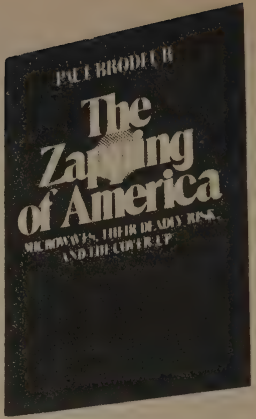
How is Crumb different, in task and audience, from Trudeau liberalism? If you're talking about "Doonesbury," there are a number of differences between me and him that I can think of . . . first of all, he makes about a billion dollars a week . . . second, he can't draw worth shit, and has other people doing it for him . . . third, he goes for the mainstream audience, which I gave up on long since . . . mostly, I guess, it's that he's happy with the successful formula he hit on, while I'm still whacking off in the woods. He *knows* what he's doing, . . . and I *don't*.

— R. Crumb from "Comix Today," CC No. 5

The Zapping of America

by Paul Brodeur

REVIEWED BY ALVIN DUSKIN



The Zapping of America
Paul Brodeur
1977; 343 pp.
$11.95 postpaid
from:
W. W. Norton & Co.
500 Fifth Avenue
New York, NY 10036
or Whole Earth

There's been much talk lately on how to get all of the people who are angry and active on the subject of nuclear power plants to pay some attention to the far greater threat of nuclear weapons. Up to now it's seemed that you can't. People usually get actively interested in nuclear power when they hear that their local power company is planning to build a power plant somewhere up-stream or up-wind of where they live. Then they'll start getting signatures on an anti-nuclear petition – as in California and the Western states – or organizing an occupation of the proposed site – as in Seabrook, New Hampshire, or at least getting people together to sponsor a law-suit.

There's a direct threat from nuclear power because of the chance that if the plant is built, something produced in that plant will contaminate *your* territory or be something that *you* or *your kids* will inhale, eat, drink, or be zapped by. Nuclear war would result in a contamination or an ingesting and a zapping on an infinitely larger scale. But the scale is so great, and the most effective directions for citizen action so difficult to come to agreement on, that there have been almost no attempts at mass-based protest on nuclear war in the last decade.

A very interesting test of people's reactions can be made. The test has two parts. You walk into your local PTA or Rotary Club or Sierra Club and announce:

> (1) Our local utility has declared their intention of building a nuclear power plant 100 miles from here. Note the reaction of the members present.
>
> (2) Our armed services have stated that their strategy for dealing with a Soviet invasion of Western Europe is (a) counter with planes, tanks, and machine guns, and if that doesn't stop them, (b) counter with strategic nuclear weapons, and if that doesn't stop them, (c) blow up the world. Note the reaction of the members present.

The chances are, strangely, that the far stronger reaction will be to the first case. The second, actually a summary of a recent statement of one of our leading defense analysts before a committee of the U.S. Senate, is simply too remote for most people.

Now, assuming that the test has shown the difficulties of arousing people on the subject of strategic nuclear war, try another test. If you live in a coastal state, you've probably noticed somewhere in your neighborhood a giant dish antenna. They're often on the high ground, sometimes inside white structures that look like giant golf balls. Take Paul Brodeur's *The Zapping of America* with you to the next meeting of the PTA/Rotary/Sierra Club and, partly quoting from it, announce:

> *"That giant dish antenna which has been quietly sitting on our hillside for years has been tilted downward toward the ocean so that it can detect Soviet missiles as they might emerge from the sea. Lying between the sea and this immensely powerful, continually sweeping, radiating antenna is us."*

Note the reaction of the members present.

The Zapping of America is a book that can help bring the arms race to the American public because it shows that the actions of the military are hurting us now, not simply in the "unlikely" event of a nuclear exchange. Something like the hypothetical test speech has already been made to the people of Texas who live between the SLBM radar at Laredo and the Gulf of Mexico, the residents of Cape Cod who live within the sweep of the radar at Otis Air Force Base in Falmouth, Massachusetts called PAVE PAWS (Precision Acquisition of Vehicle Entry Phased Array Warning System), and the people who live west of Beale Air Force Base near Santa Rosa, California, site of the Western model of PAVE PAWS.

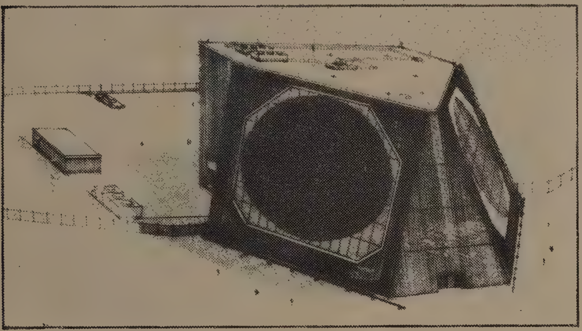
Because it turns out that microwave radiation – radar, radio and TV broadcasting, communication systems, microwave ovens – is not good for people. Too much in the short term gives you things like eye cataracts, blood disease, chromosome breaks, cancer, raised white blood cell count, etc. In the case of low levels of radiation for long periods of time, nobody knows. As they claimed in the early days of concern about radiation associated with the nuclear industry, the government starts from the position of saying that microwave radiation is relatively harmless. Or more accurately, it's harmless when the military, or the television broadcast industry, or the microwave oven companies irradiate taxpayers, viewers, and customers. When the Soviets zap us, with more or less malice depending on your political position, the situation is different, even though a Soviet microwave is not at all different than an American microwave.

The great international case began with the discovery in 1962 that the Russians were irradiating the American embassy in Moscow with low-intensity microwave radiation from a building across the street. The level of radiation the State Department claimed to have measured – 18 microwatts – had always been considered safe. Five years later, President Lyndon Johnson asked the Russians to stop, but it took a full thirteen years for the State Department to install screens on the windoes and admit that Moscow was an "unhealthful post" and that "employees stationed there would receive a twenty-percent raise in salary as a hardship allowance."

The twenty percent was to compensate them for the risk of chromosome breaks, blood disorders, cancer, malformed babies, mental disorders, et al. All unhappy situations that in fact caused bodily damage to employees and their families at the Moscow Embassy at a rate that sent droves of lawyers into the courts with claims for damages against the State Department.

But the general public? According to Brodeur, "no one . . . has been able to learn much about electromagnetic pulse (microwaves) — let alone voice objection to it. The American people have not had the opportunity to oppose numerous schemes and devices resulting in the proliferation of microwave and radio-frequency (TV and radio) radiation. The reason is that information about them has been highly classified — and thus suppressed — for reasons of national security."

But some information is starting to get out. Take as a standard 18 microwatts, the strength of the "Moscow Signal" which led to the eventual installation of metal shielding on the walls of the embassy and the admission by the State Department that Moscow was an "unhealthful post." The claim that military radar and commercial television do not cause damage to "human systems" comparable to the damage caused by radiation from nuclear sources or X-ray overdoses places, in Brodeur's words, "the government of the United States in the untenable position of taking measures to protect a few hundred Americans in Moscow from levels of radiation to which, as it has good reason to suspect, millions upon millions of American men, women, and children are being exposed every day."



Courtesy of U.S. Air Force.

Artist's conception of PAVE PAWS radar on Cape Cod.

Exactly who is getting the biggest zapping?

(1) Workers, repairmen and service people in the radar, television, and microwave industries.

(2) People who live near radar stations. And people who walk on the beaches nearby. The North Truro (Massachusetts) radar station "is irradiating people . . . with a power level about a hundred times greater than the power level for which the State Department told its Moscow employees it was installing aluminum window screens for their protection."

(3) People who live in the line of sight of television towers. Because "microwave radiation generated at television frequencies (can) . . . penetrate deeply into the human body and affect the central nervous system."

So where do you go to get away from all this? If you live in the city, stay out of tall buildings if they face television towers. The level of radiation can be many times the level of the Moscow signal "particularly (for) those residing or working in high-level apartments or offices in cities." Brodeur cites the 66 microwatt level of the Sears Tower in Chicago and the 97 microwatts of a Miami office building. If you happen to work on the fifty-fourth floor of the Pan Am building in New York you only get 10 microwatts, so you have a better chance of not getting cancer than three consecutive ambassadors to Russia who spent their days in an environment of 18 microwatts. In the country, stay away from radar stations. Overall, avoid every airport, airplanes, ships, and pleasure craft outfitted with radar. Don't let your kids look into microwave ovens to watch cakes rise, avoid electronic games, CB radios, remote control transmitters for model airplanes, video display units of the kind used by banks, airlines, and libraries; kids and cops walkie talkies, garage door openers, and don't get under communications and surveillance satellites that are beaming microwave radiation back to earth from outer space.

All of this leads to the question of why the appropriate federal agencies have not set standards for microwave pollution such that Americans in America would be as protected as Americans in Moscow. The answer turns out to be stunningly simple: if the dangers of things like microwave ovens and TV transmission towers were made clear to the American public, the Department of Defense (DOD) — by far the largest user of microwave radiation for reconnaissance, surveillance, and communications systems in space and in air, sea, and ground operations — would be forced to, in their own words (Brodeur quotes DOD internal memos), "take a stand" against standards which would "constrain DOD operations." They would have to either zap us less by cutting back on their attempts to keep a jump ahead of the Soviets or they would have to buy up all the dangerous real estate around the Army's bases, the Air Force's radar stations, and the Navy's ports.

Yellow hazard lines are now used on ships to define areas where microwave radiation is deemed by DOD to be dangerous. Realistic standards would mean that yellow hazard lines would have to be drawn, according to DOD estimates, around 498,000 acres of American land. Unfortunately for the DOD's purchasing agents, there are cities within that 498,000 acres, and suburban and country land, where people live including members of Congress, "who are thus far conveniently ignorant about this incredible situation."

Postscript: This reviewer is a San Franciscan. I called Brodeur to see what he knew about microwave levels in local high-rises facing the Sutro Tower. He referred me to the Electromagnetic Radiation Analysis Branch of the Environmental Protection Agency, 9100 Brookville Road, Silver Springs, Maryland. I called them. Yes, they had measured radiation near the windows of tall buildings facing the Sutro Tower. About 100 microwatts. About five times the Moscow Signal. ■

—Brand

Fly-on-the-Wall Department

Flip Points

Jerry Brown Meets Marshall McLuhan

It's been a dozen years now since Marshall McLuhan's ideas about the media gained wide popularity in the United States. Flippant, aphoristic and delivered as though they were empirical data rather than personal opinion, McLuhan's statements force us to look at things from a fresh viewpoint.

With the slogan "the medium is the message," McLuhan alerted American intellectuals that the media had, without our noticing, ceased to describe the world and had begun to replace it. Only quite recently (as in the Youngblood and Mander pieces earlier in this issue) have theorists who followed begun to shake off the rather passive, pawn-of-history feeling that McLuhan's early works evoked and proposed projects to dismantle or modify those media which threaten harm to the human spirit.

McLuhan now is completing a new work, **Laws of the Media**, *which elaborates upon some of the ideas launched in* **From Cliche to Archetype**, *a 1960's collaboration with Wilfrid Watson.*

Last July, heading back to his home in Toronto after an Australian visit, McLuhan stopped in Sacramento to meet California Governor Edmund G. Brown, Jr. The meeting was arranged by McLuhan's daughter Mary, who, soon thereafter, was named by Brown to California's state Board of Education.

At the time of the meeting, Brown was puzzling over why increased spending on schools results in no measurable increase in learning. McLuhan had brought with him a new text on the use of cities themselves as schools, and the conversation began with McLuhan's explanation of how television affects learning and the ability to read.*

—LL

McLuhan: Television is not a visual medium. It is an acoustic medium, an audile-tactile medium; the image is not visual. Its components are innumerable little mobile dots rubbing against each other and creating a very tactile abrasive effect. There're no shutters, there're no pictures on TV. No frames, you see. It's just a continuous pick up. And it's fed to the viewer — he doesn't look at a screen, it looks at him. The viewer is the screen on TV, and he goes inside the image. TV is inner trip, it's addiction and inner. Now it's all peripheral, there's no point of view on TV, and this too confuses the ordinary school kid who is —

Brown: All peripheral . . .

McLuhan: Yeah, it's like this. It shoots out acoustically, you see, just like ripples on a wave. No tunnel vision is possible on TV, and tunnel vision is what any kid needs learning to read. I have a friend in Ireland who once explained to his tennis students, "Don't read any books during the summer — ruins your game." Because the book is tunnel vision and tennis is all peripheral. Now, a good car driver is not a tunnel vision man. A highly literate person is a lousy car driver, because he can't see to the side.

Brown: You're saying watching television is incompatible with good reading habits?

McLuhan: The imagery there is, instead of sitting back objectively looking at a page, you are drawn into that tube, as an inner trip. You're totally involved. You have no objectivity, no distance. And it is acoustic. It resonates. But this is a hidden ground, because superficially people think they're looking at a visual program. And they're not.

Brown: So, what are they looking at?

McLuhan: They're not looking at all — they're absorbed involved in a resonating experience. And it is not objective, it is entirely subjective.

Another area where you can study hidden ground is in the sudden successes of movies, tunes, musical forms, behind every sudden success there's a new ground.

Stewart Brand: What's happening with *Star Wars?*

McLuhan: Nostalgia. Loss of identity. Drives people to nostalgia. I mentioned that business about the electronic man having no physical body. He puts nostalgia in place of the physical body. Huge new hunger for the way-back-when. They even develop nostalgia for yesterday's movies. But *Star Wars* is based on Flash Gordon and comics of the '50s, when kids were growing up. And they feel safe back there. There were moral values, solid certainties.

Brown: The people who are watching it are mostly kids. They didn't know about . . .

McLuhan: Exactly, but the same with *American Graffiti*. The kids are looking for some sort of stability. And the old comics have that kind of solid moral values — everything was right or wrong. And there are no moral values at the speed of light. Moral values just dissolve. That's why you have separatism all around the world. Legal structures will not hold up at the speed of light. Electric information takes the place of legal bonds. The separatism in Quebec is based upon an upsurge of old acoustic memories, nostalgia for the past and the sudden desire to break the legal bonds with Canada. It ain't gonna happen. But that's the motivation.

Brand: Why won't it happen?

McLuhan: Oh, there's lots of countervailing forces. Take quite a while to explain the number of countervailing forces. The American South was oral country in 1860, it wanted out. The sudden upsurge of oral memories in the South came with the telegraph, 1840. Now, you can open any American history book about the causes of the American Civil War and you will find the first statement is, we don't know what caused the Civil War.

Brown: You think it was the telegraph?

McLuhan: I suggest that that was a new hidden ground. The telegraph was just 20 years old when the South wanted out. At the present time the South is in, you've got a Southern boy in the White House, Huck Finn in the White House. The Deep South is in the White House for the first time in American history. Now why? The TV has created a kind of nostalgic image of the South — including Haley's *Roots* and so on. This is a very very powerful and hidden ground. Carter knows nothing about it. Nobody told him. By the same token, of course, Nixon lost the battle exactly on that front. He had no idea what sort of image to present to the world. All he had was a private face. And a private face is of no use at all on television. You have to have a group face. That's called charisma. You have to look like a lot of other nice guys. Had Nixon had a beard, he would still be in the White House. Because he would have had a kind of familiar Abe Lincoln look that would have given him just the necessary edge to survive. But that miserable private face hanging out. He didn't look like anybody else except Nixon. And that won't work.

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*City as Classroom by Marshall McLuhan, Kathryn Hutchon and Eric McLuhan. $4.95 (Canadian) from The Book Society of Canada, Ltd., P.O. Box 200, Agincourt, Ontario, MI5 3B6.

The group identity is where the nostalgia is now. We're looking for who were we back when. But nostalgia is an electric phenomenon, taking the place of old hardware. We could even work up a nostalgia for the present we're in, but that hasn't been thought about yet.

Now one of the things that happens at the speed of light is that people lose their goals in life. You cannot have a private objective at the speed of light. Too big an area is covered at the speed of light. So goal-orientation and objective seeking is out as far as the young are concerned today. It's meaningless. So what takes the place of goals and objectives? Well, role-playing is coming in very fast. And role-playing means teaming up with other people in jobs and tasks, changing the whole shape of work and jobs into group form. And, which is in a way tribal, or family, patterns. I think at the speed of light the return to family patterns and tribal patterns is inevitable. Or is overwhelming.

But I was going to mention another huge hidden factor in the situation that we're talking about. I'm talking now about the brain hemispheres. You've all heard about the twin hemispheres. Because all that work was done right here in California. The twin hemispheres, it has been discovered, have varying degrees of a dominance or prevalence in our lives. The left hemisphere is logical, connected, and lineal, and classificatory. Everything that we like to do in the way of putting things in their places is left hemisphere, including putting words in their places, which is grammar or ordinary expression.

The right hemisphere is not lineal, it is simultaneous, it's a world where you can recognize faces. The left hemisphere, the logical one, cannot recognize a human face. Only the right hemisphere can see a face or a pattern, a complex character. So art, all artistic form, is in the right hemisphere, and all acoustic form and music is in the right hemisphere because it's simultaneous.

What is happening in the simultaneous or acoustic hemisphere, the right hemisphere, has underneath it a new environment of electric information. For the first time in human history electric information is underneath the right hemisphere and pushing it up, up, up. The old dominance of the left hemisphere depended upon lineality in organized road systems and production systems and so on. All the lineal connected activities of man over the centuries supported the dominance of the left hemisphere, which is logical and of course legalistic. That dominance of that hemisphere has been enormously altered by the sudden environment of simultaneous information. The world has now got everywhere on this planet available to it simultaneous environments of information. The satellites are available everywhere and so is the telegraph and the telephone.

Now simultaneity just automatically gives preference to the right hemisphere. This has nothing to do with value judgments. We're not saying which is good, which is bad. This is just the way we are, happen to be put together.

Brown: So what's the implication?

McLuhan: The implication is that as we move into the right hemisphere again we are going Third World. And you have only to study the Third World to know what America is becoming very rapidly. That doesn't mean it's a bad thing. It just means that we find huge sympathy now with Oriental attitudes to experience. The kids take it for granted that the occult, the hidden, and the mysterious is their thing. The ordinary kid today knows all about horoscopy, all about all sorts of hidden factors. He takes it for granted. It's not taught at school.

Brown: And that's why the low reading scores and the problems in schools emerge, because the kids are thinking about something else?

McLuhan: Well, of course. If the left hemisphere is getting pushed down and the other one up it means that music — rock 'n' roll and whatnot — is taking the place of literacy, yes.

Brown: Well, maybe reading is less important.

McLuhan: Quantitatively, yes. But perhaps strategically and in terms of survival, maybe not. Who knows? But I think it is not an exaggeration to say that there has been this huge shift in the hemispheres.

Brown: Is that an evolutionary thing?

McLuhan: Insofar as it is based upon our own technologies, which are part of us, yes, it's evolutionary. Because, after all, your technologies are an extension of your own body and nervous system.

Brown: People in this office don't watch television. We're never finished working by the time the news gets on.

Brand: They do read the newspaper and they Xerox it endlessly and pass it around . . .

McLuhan: This is one of the things I like to play with. Gutenberg made everybody a reader. Xerox made everybody a publisher. That's a complete flip. Now what has happened in business and politics since everybody became a publisher? Watergate was one of the by-products of Xerox. The Pentagon Papers were Xeroxed position papers. Xerox revolutionized decision making and revolutionized politics.

I'd like to hear your thoughts about inflation and job shortage because I think both of them are closely related and I think they both have hidden grounds that nobody has mentioned.

Brown: Inflation and job shortage?

McLuhan: Yeah, money excess and job shortage. I wouldn't say they were tied together, but I say they are sort of parallel. "What are you going to do about jobs?" "What are you going to do about inflation?" Always mentioned together. I do know that economics theory is based on equilibrium theory and that equilibrium is meaningless at the speed of light, that when information moves at instantaneity you cannot have an equilibrium between money and products.

Brand: Because there's no lag in the feedback?

McLuhan: Well, no. Because the information can pour in from any angle and upset that balance at any time. As the stock market well knows, a news story can smash any equilibrium, and this has been happening for a long time. I would suggest the possible approach to inflation would be that since money enhanced the speed of transactions — that's what money did to begin with, it obsolesced barter, enhanced speed of transaction — well, instantaneous credit which took over from money, pushes up the speed of transactions exponentially, fantastically. I don't think there's anything in the world of products that can match or approximate the speed of information transaction by crediting. So the credit situation is automatically inflationary.

I think surely we have been reaching one of those limits where the flip point comes, you know? I discovered this, that every kind of cultural artifact has a structure which is a, b, c, d.. For example, a zipper (a) enhances clasping, (b) it obsolesces buttons and bows, (c) it retrieves long sweeping robes, and (d) it flips into velcro. That four-structure is true of all human artifacts — words, theories, philosophies, laws, and so on. If we wanted to find out what the future of inflation is, we'd have to ask ourselves: What does credit enhance? What does it obsolesce? What does it bring back that had been obsolesced earlier? And what does it flip into when pushed to the extreme? Well, we know one of the extremes is flipping into inflation.

In politics, bureaucracy is the great big structural form that we're contending with at the moment, eh? And so you ask yourself, what does bureaucracy enhance, what does it obsolesce, what does it retrieve, what does it bring back that had been around much earlier, and then what is it going to flip into when pushed to its ultimate limit? One of the big flip points in any operation is commando tactics. Commando means everybody in the operation has equal information — equal authority and autonomy to improvise on the spot anything he wants. We haven't reached commando stage yet, but we will. That point will be reached in bureaucracy.

Brown: Well, what kind of organization is that?

McLuhan: What is a commando unit in terms of organization? What is it? It's crisis, isn't it? It's absolute crisis.

Brown: You think bureaucracy leads to crisis.

McLuhan: Absolutely. To anarchy. Because the only way to live with bureaucracy is to bypass it and to increasingly undermine it.

Today work is the moving of information. The way you people here and people in any part of this community spend their time from day to night is processing information. That is your work. Now that is not a job. Information processing is role-playing. Role-playing means having a variety of jobs simultaneously. A mother has a role, doesn't have a job. She has dozens and dozens of jobs, simultaneously. And that's what you people are involved in. Or all of us.

Adriana Gianturco *(Director of Transportation Department)*: But there's a whole other sector of the economy, blue-collar jobs which are more fragmented, more mechanistic, more formalized, less role-playing than they ever were before.

McLuhan: Yes, that's right. And that means they're just reaching the point of flip, they're just about over. Any kind of work, any kind of activity just at the point of flip into the opposite form exaggerates all its characteristics to the extreme. When any particular form of activity reaches its term of potential it flips into the opposite form. It shows exaggerated features of all the old forms just before they cease to exist. Money speeds activity, obsolesces barter, retrieves potlatch, and flips into credit, which is not money.

All economists are 18th-century. Galbraith and so on, the Friedmans — all 18th-century men. They still work out of the Age of Enlightenment and Newtonian equilibrium. Every one of them. I know the economist scene fairly well and I grew up studying economics to a point. But they are 18th, 19th-century men and using mechanical models only. There is no economist that uses an information model for his analysis. Literally. They are all Newtonian physics. And that's all left hemisphere. There are no right-hemisphere economists.

Another voice: How do you resolve the human problems which exist in the society whether you call them jobs or some other name?

McLuhan: You know the way. If you're uncomfortable where you're sitting, you tend to shift around a bit, the same way with jobs. People get uncomfortable, they shift around a bit. And families too. So when you ask how does one overcome these difficulties, it's like asking what posture should these people adopt in order to feel more comfortable. It's a very big question. The first question is to know what is the *question*. Not what is the answer. If you know the right question, answers are fairly easy. But finding the right question is not so easy. And that means finding the hidden ground. If you don't know what the real underlying change is, unless you know what has really changed in your environment, it's hard to formulate questions.

Mary Parker Follett was the first management consultant, about 1904. She invented management study and she invented the phrase "the law of the situation" and by law of the situation she meant the way in which the figure and the ground relate. So she would ask, "What business do you think you're in? You make window shades. And you think you're in the business of manufacturing window shades. Suppose you're really in the business of light control? Which has nothing to do with window shades at all. . . ." So that was her approach. You could ask people in government the same question. What business do you think you're in? Obviously it's not the same business as the government of 50 years ago. Or 30 years ago.

You mentioned satellites. Instead of installing telephone lines, satellites make it possible to bypass telephone wires. And to bypass all the hardware installations of yesterday. One of the effects of moving at electric speed is that all hardware tends to become software. Not entirely, but tends in that direction. And all information tends to decentralize. At the speed of light centralism tends to yield to decentralism. That's where small becomes beautiful. The decentralism means that small operations once more begin to make sense. Whereas under the older system of centralism based on hardware data and hardware information and so on, centralism was indispensable.

Brand: People don't stay in one place long enough for small to make sense. They shift too fast for it to take hold.

McLuhan: No community.

Brown: You don't have the communities where you work, where you go to school. Maybe your community is your taste. Do you think that we're becoming a more irrational society? For example, in the Alexandrian period you had the movement away from the rational, the stoic, into the mystery cults. Do you think that's where Western society is heading? And does that fit into what you're saying?

McLuhan: The good old Greeks and Romans. I've spent a lot of time studying their problems. The alphabet destroyed Greece — in 100 years it was dead. The alphabet invaded the Greek sensibility with this new rigid logic pattern which created a Plato and Aristotle overnight. And Euclid. All left-hemisphere boys. Extreme left hemisphere. And they wiped out the old pre-socratics. Remember some of the pre-socratics like who was the "you can only step into a river once"?

Brown: Heraclitus.

McLuhan: Heraclitus and that group. Were all wiped out overnight by the alphabet. But naturally the world was still surrounded with oral societies, the little area of literacy, Greek and Roman, was still surrounded by Third World occultism — Asiatic they called it, and which included Christianity. And they fought it back and they took over a lot of the set up again. One of the mysteries to me is why did the new thing, Christianity, ever latch on to the new thing, the alphabet? Why did Christianity, why did this entirely right-hemisphere thing latch onto this entirely left-hemisphere thing? I've never seen it commented on by theologians or historians. There may be a paragraph hidden away somewhere, but I have yet to find it. But this is one of the biggest mysteries I think in human history.

Brown: Why Christianity took on what? Language? Or logic?

McLuhan: The Greek or Roman literacy. Which was entirely logical. And left hemisphere. Lineal. Euclidean. Why did Christianity ever take on that thing? Well, you could say that anything as extremely right hemisphere as Christianity needs something to prop it up. On the other hand, today, with electric technology you no longer need Greek or Roman literacy to propagate Christianity. For the first time in the history of the church, Christianity could use the electric technology for propagation of the faith.

Brown: But I still want to get back to this other thought about the occult, the . . .

McLuhan: . . . hidden . . .

Brown: . . . magic, the . . .

McLuhan: . . . vibes — it's acoustic.

Brown: "Vibes." What's the other phrase, from astrology? "What's your sign?" How do you fit that into this?

McLuhan: You don't have to fit it. You tune it. Literally. Fitting is left hemisphere. Tuning is right hemisphere.

Brown: Well, let me go to the next point, though. If we're moving toward a more irrational magical . . .

McLuhan: "Irrational," you see, is only a negative way of describing something that is happening which is positive.

Brown: But if you give up these categories, then do we get some kind of very different society? We have a society built on Mosaic law and codes and when you flip that over you may get a fairly mixed bag.

McLuhan: In the year 1900 Max Planck produced this new quantum physics in which he pulled out all the connections, said there're no connections in matter. The same year Picasso pulled out all the connections in space between art forms. The same year Freud, that's 1900, Freud pulled out the connections between the conscious and the unconscious and began his dream analysis. In that year all the connections were pulled out between all the things that had been joined before. And at the same time when Picasso pulled out the connections in space — cubism means all spaces simultaneously — when he pulled out those connections he plunged back into the utmost form of primitive consciousness. That is where modern man started, in 1900. Back into the most primitive kind of awareness. And this is where it's at.

Brown: Now, some people think that things were better before man started clustering into cities and forming civilization. That the relationship with nature and with one another was a more harmonious balance. I don't know whether that's Rousseauism or accurate, but I know some people who believe that.

McLuhan: Electronically we have an opportunity to harmonize our various components of our lives beyond the dreams of anybody of an earlier time. Because with that sort of power and information available and speed, it is possible to create a total harmony out of the noises of the environment or out of the noises of the economy or anything. We can musically harmonize our lives to a fantastic degree today. And we are tending that way.

Brown: Gregory Bateson I think raised the question of whether the rate of change is so fast that we can't assimilate it and that tends to disrupt things.

McLuhan: Well, adjusting in the ordinary neurological sense is not very fast. On the other hand the mind of man is very much faster than light.

Brown: So you're not concerned about the rate of change?

McLuhan: Not at that level. You see when you're dealing with very large patterns the mind is far over above the speed of light and technology. You can go to Mars and back in a split second, mentally. It takes minutes for light to go from Mars to here. Seven minutes or something like that.

Brown: So you don't think that the shape of future societies will be more negative than the present one because of the information overload.

McLuhan: Information overload is pattern recognition, says IBM. Once you create enough chaos then you get order. You know, by the time your house gets into a sufficient mess you take a few hours off and tidy it up. And that's the state we're at today in the world.

Brown: How do you fit this into the human freedom as we have traditionally thought about it?

McLuhan: Individualism in the sense of just carving a little old egotistic path for yourself, that's way behind us. People are reaching the point where they're just going to abandon that overnight.

Brown: So what does that do to capitalism?

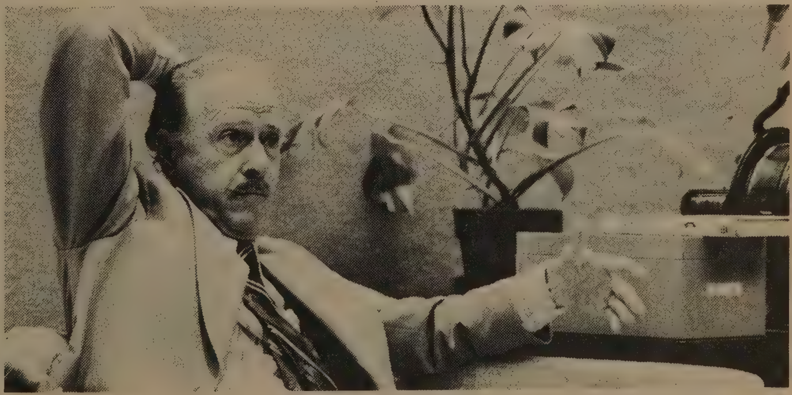
McLuhan: Capitalism, I think, like communism, is way behind us. Something we passed long ago. In terms of sharing our knowledge and our technologies to create a consumer society for everybody, we passed the communist dream decades ago. And as far as capitalism is concerned, I don't think it ever had a dream. But whatever it was it's no longer here.

Brown: So what is it that we're tending toward?

McLuhan: Well, it's like asking that question of *Star Trek*. We're in a kind of a big spaceship with everybody a crew member and no passengers.

Brown: No passengers.

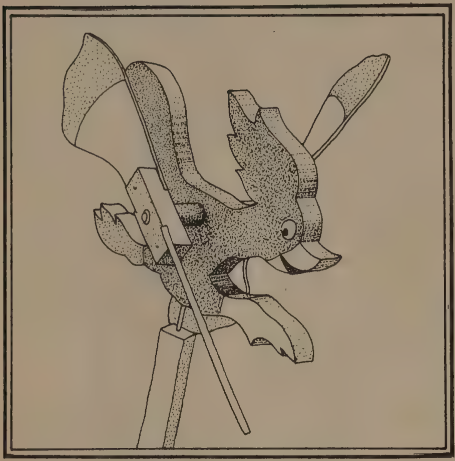
McLuhan: No passengers on the spaceship Earth. Everybody's crew. ■

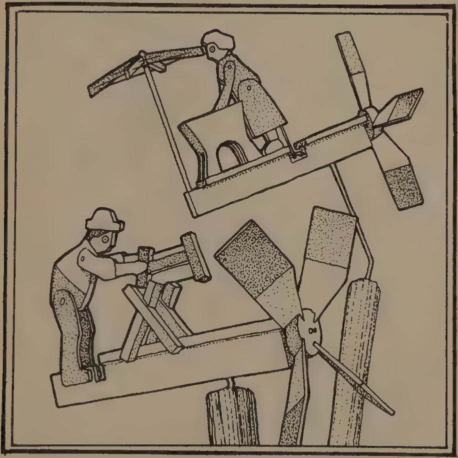


Brand

Space Stations

Story and illustrations
by TOM PARKER





Another day: nursing an old car down the state highway. A dismal sky straddled clear autumn air. The road was smooth and deserted. Worn valves and broken seals leaked vapors of stale gasoline. The heater coughed fumes of dust and hot cardboard. I brushed at a lapful of crumbs and settled back to watch the world slide by.

Along came those odd little houses. With the ornaments – you've seen them. My grandfather called them space stations. Each one hugged the berm, the yards trembling with whirli-gigs, chrome globes, and plastic creatures. I absently ticked them off on the odometer. First I passed a brilliant pink cottage; ten miles further I passed one painted a luminous turquoise, another ten miles – another pink one. They were strung out like Christmas lights on a road draped hill to hill. Somehow I'd never noticed before. And they seemed so lonely, those houses; there was something wrong about them, something unreasonable. There were no pets, no children, no people in the windows, no people in the yards. But it was more than that.

I left my car on the shoulder and wandered towards the busy gismos and gadgets crowding the front of the tiny house. The painted faces leered as I stepped closer. The windows stared cold and vacant. The air was thick and highly charged; the hair on my wrist tingled and stiffened. I stood with those little glass people grinning at my knees. I watched them all twisting and turning – the pinwheels, the windmills, the spinners. The wooden ducks flapped their wings, the daisies spun, the painted chlorox bottles twirled in the ozone air. The ozone air! I stood fastened to the lawn as my stomach tied a knot. There wasn't a whiff of a breeze . . . ■

1077
TOM PARKER

TOM PARKER © 77

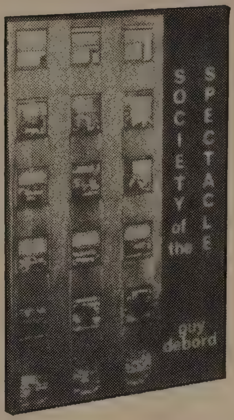
Three Book Reviews by Jerry Mander

Society of the Spectacle

Guy Debord is foremost among an obscure group of European intellectuals who call themselves Situationists. They have developed an analysis of the ways in which all experience of human beings living in western capitalist society has been mediated, abstracted, made into artificial representation of itself. Human beings who formerly lived in a direct relationship to the planet can no longer do this, as commodities — buildings, technology — have replaced direct human-to-planet experience. It has been the goal of the capitalist industrial drive to achieve this intervention, so people will drive rather than walk, so they'll get information from machines rather than directly. In this way, experience can be converted into saleable form, industrialized, made repetitive, centralized and controlled.

The Situationists do not see what we call "media" as different in kind from products or ballgames or, for that matter, human feeling which is itself industrial through advertising. Media, in effect, becomes a house of mirrors by which people obtain objectified views of themselves, and learn who they are and how to live. So all of life, including our innermost feelings, is removed from our own control, abstracted into a spectacle which we observe and absorb. All life becomes a movie. It is alienation to the tenth power. Life and commodity are unified.

Society of the Spectacle
Guy Debord
$1.50 postpaid
from:
Black and Red
Box 9546
Detroit, MI 48202



The entire life of societies in which modern conditions of production reign announces itself as an immense accumulation of *spectacles*. Everything that was directly lived has moved away in a representation.

•

The spectacle is not a collection of images but a social relation among people mediated by images.

•

The spectacle is the material reconstruction of the religious illusion. Spectacular technology has not dissipated the religious clouds where men had placed their own powers detached from themselves; it has only tied them to an earthly base.

News from Nowhere

This is the definitive book on how a collaboration of commercial and technical factors conspires to confine television news in content and also in style. When Walter Cronkite says, ". . . and that's the way it is," what he is really saying is, ". . . and that's all the news this incoherent failure of a communications technology is capable of delivering, and it's all the network management will permit." Interviewing the actual people who do the work — news producers, editors — Epstein creates an impressively precise description of just what can get to be news and what cannot. Most events of the world cannot. This was a landmark book when it appeared in 1973, and still is now. The news is "news." Spiro Agnew was right.

News from Nowhere
Edward J. Epstein
$10.00 postpaid
from:
Random House
455 Hahn Rd.
Westminster, MD 21157
or Whole Earth

"Our reporters do not cover stories from *their* point of view. They are presenting them from *nobody's* point of view."

— Richard S. Salant
President, CBS News
of CBS News

Since news stories tend to be constructed from those aspects of a happening that can be easily filmed and recorded, and not from the poorly lit, softly spoken or otherwise inaccessible moments, events tend to be explained in terms of what one producer called "visual facts." One correspondent pointed out, for example, that television coverage of riots or protests at night tends to focus on fires, even if they are insignificant trash can fires, since they provide adequate light for filming. Hence urban riots tend to be defined in terms of the "visual facts" of fires, rather than more complicated factors. Visual factors, of course, occupy only one range of phenomena, and thus tend to limit the power of networks to explain complex events.

The Show and Tell Machine

By a Cornell professor of sociology, this is a meticulous exposition on the forces that move TV executives to create the kinds of programs they do, and the nature of the information environment that results. Writing from the perspective that television creates mass consciousness more thoroughly than any other force in our society, Goldsen reveals what consciousness is being created, what other ways of mind are being abandoned, and how appropriate the change is for the objective drives of the corporations that run the show. An amazing series of appendices to the book present list after list of the categories of lifestyle and subject which television management has chosen to deliver, e.g., in 1974-5, during network prime time, eighteen programs were about men who live without any commitment to a female, while four programs concerned women without any commitment to a male.

The Show and Tell Machine
Rose K. Goldsen
$12.00 postpaid

from:
The Dial Press
1 Dag Hammarskjold Plaza
245 E. 47th Street
New York, NY 10017
or Whole Earth

The power to dominate a culture's symbol-producing apparatus is the power to create the ambience that forms consciousness itself. It is a power we see exercised daily by the television business as it penetrates virtually every home with the most massive continuing spectacle human history has ever known. In daily consciousness raising sessions, the television business constantly demonstrates the narrow range of alternatives selected by a handful of people as eminently worthy of attention and collective celebration. The unanticipated outcome of it all is that the United States of America enjoys the dubious distinction of having allowed the television business to score a first in human history: the first mass undertaking in mass behavior modification by coast-to-coast and intercontinental electronic hookup.

THIS CONCLUDES OUR SPECIAL BROADCAST SECTION. WE NOW RETURN YOU TO OUR NORMALLY SCHEDULED PROGRAMMING.

The Greens *(Les Vertes)*

The new dialectic in French politics

BY SYLVIE CROSSMAN

THERE USED TO BE TWO COLORS in French politics: grey and red, with various shades. In fact there was only one color, for the leaders of all the established political forces wore the same traditional grey suit. Even though George Marchais* delivered his speeches under a red flag and François Mitterrand* wrapped his biography and manifesto, "The Rose In Hand," in the petals of a rose. Only the Right lived its greyish metallic prosperity as the ideal color and the Left as a makeshift before its dyeing in red.

They used to be but a vague symbol: grey as tradition and red as revolution.

But since the last municipal elections of March, 1977, the color green, which had timidly appeared a few times before, has now spread across the French political palette. The newspaper headlines read, "The Green candidates, the Green terror, the Green peril, the Green tide, the Green electorate, the Greenish . . ."

The "Greens" were 1200 candidates running in March, 1977, and 2,300,000 voters. They made their entry into politics when the first ecology candidate ran in Mulhouse (city located in the North-Eastern province of Alsace) in the legislative elections of 1973. They came back the next year with René Dumont** as their first green candidate for the presidency. With 1.3% of the votes, Dumont emerged as the congenial Don Quixote of the elections. But it was not until the 1976 county elections, when the Greens gained 8% of the votes, that the headquarters of traditional politics started to pay attention to them, feeling more and more threatened. The threat was confirmed a year later by the ecologists' escalating performance – 12% at the polls.

Like the forest of Macbeth, a Green army, they proceed impressively fast for a four-year old political force. They have the color of water when they campaign on a barge on the Seine; the color of earthly goods when they hand out their all-green poster/program on the local markets. And they speak a new language, a Green language whose color is no more a vague code but the color of their true candidate, the tree of life – the "objective language of utopia."

IN THE LATE SIXTIES and early seventies, the "Green tide" started to swell in the outlying rural parts of France which were particularly affected by the "years of growth" and the accelerated industrialization that was ordered from the centralized government in Paris. Southern France and Alsace (a northeastern province of France) stirred up an instinctive and geographically-limited protest which was to spread throughout France and converge into a national political force.

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* George Marchais is the leader of the French Communist Party and François Mitterrand the leader of the Socialist Party.

** René Dumont, a 73 year-old agricultural expert, taught at the National Institute of Agronomy in Paris from 1933 to 1974. He was a pioneer in denouncing misery, starvation and colonialism in the third-world countries. He is the author of several books, among which are **The Future Is Not Too Bright For Africa**, and **Utopia or Death**.

Sylvie Crossman is French, 23, and working in southern California as a free-lance journalist for **L'Express, Matin de Paris,** *and* **Le Sauvage.** *She grew up in Morocco, Austria, Spain, Tunisia, Tahiti quite a bit, and some New Zealand and Australia. She graduated from the Ecole Normale Superieure in Paris. Since 1974 she has been working on a book about Henry Miller –* **Henri Miller ou le Jouissance.**

Cartoons and photos with the article are from the fine French publication **Le Sauvage** *($16 a year from: Le Sauvage, 12 Rue du Mail, 75002, Paris, France).*

–SB

Radio-verte – *"Green radio" – launches its antenna for the historic 37 minutes of pirate radio broadcast of ecology and politics on May 13, 1977, at 7 p.m. in Paris.*

This reaction was expressed, in Southern France, through the revival of the "Tradition Occitane." In the Middle-Ages, the country was indeed divided along a linguistic boundary: the South spoke the "langue d'Oc" and the North, the "langue d'Oil." Tired of the Parisian imperialism of modern France, the overcentralized agricultural policy imposed by the capital, and the chronic invasions of their rural havens by city vacationers, the locals revived their old dialect and folklore and demanded political autonomy for their provinces. In "Occitan," the angry peasants, winegrowers, farmworkers and some of their educated children scribbled on the walls of Southern France bloody messages – "We are fed up of being governed by Paris!" "Tourists, go home!" "Autonomy for Occitanie!"

If Southern France provided the ecology movement with its cultural dimension, Alsace's main contribution to the movement was political. In 1973, the Alsacian ecologists were the first to step onto the political stage, and they inspired the electoral initiatives of René Dumont and other Parisian "Greens." Since then, it is in Alsace that the escalation of the ecology movement has been the most spectacular. Some local candidates have gained as much as 65% of the votes in the last municipal elections.

As with the Southern "Occitans," the Green leaders of Alsace reclaim their distinct linguistic identity and link it to their dedication to ecology. They recall their Germanic origins and the nature-oriented Saxon tradition. Some even say they owe their political taste for decentralized politics to their Protestant culture which emphasizes personal piety, hardly compatible with the "Latin State-cult."

Stemming from what the French call "*le gout du terroir*" (the love for the soil), the Green tide is, in its rural origins, a revival of cultural sensitivity to a threatened tradition, with autonomy seen as a means to protect or restore it. As a green sociologist put it, "Ecology is the only existentialist movment in today's politics."

While these villagers were fighting for their native existence, there had sprung from the urban anarchistic rebellion of May, 1968, the extolling of rustic wisdom and an exodus of city-dwellers toward the country. The "*résidence secondaire*"* phenomenon bloomed, and hundreds of disenchanted would-be revolutionaries headed south to cure their "*ralbol.*"** They bought four thick stone walls and, when they could, a few acres of land. At the local markets they wondered at the repossessed marvels of rural life and, around the crumbling walls they were trying to restore, they merged with the traditional village authorities – the stone-mason, the shepherd, the blacksmith, the simpleton. Many of them whose pastoral utopias did not match rustic realities quickly packed up and returned to the city. Time screened out the shallow and, progressively, the authentic "returners to the earth" harmoniously blended with the ones who had never left the earth, even though the true farmers remained slightly suspicious of their sincerity.

Parallel to this rural experimentation with utopia, and sometimes merged into it, was the political and philosophical quest of the post-1968 generation. Where could they escape? Marx, their once-venerated master, had been verbally guillotined on the barricades. The traditional left had exploded into dozens of subgroups, all of which incarnated a shade of "leftism." The working-class had first flirted with the rebellion led by the students of Paris but had soon deserted it because of its anarchistic spirit, its uncontrollable ideological creativity. The walls of the Sorbonne read, "It is forbidden to forbid." The early seventies

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* A "*résidence secondaire*" is a second house, in the countryside, for week-ends or vacations.

** "*Ralbol*": literally, "full to the brim." It is slang for the malaise which affected the post-'68 generation.

have been the story of an exorcism – the exorcism of Marx. Last year André Glucksmann, the leading figure of the "New Philosophers," finally spat him out by saying that he, Marx, was responsible for the Gulag and not Stalin.

Obviously, the exuberant burst of life that had launched and at the same time killed May '68, could not be content with the sullen "productivist" Marxism inherited from the Russian Revolution. How could politics be restored to pleasure as during the fugitive feast of one particular Spring? That was the challenge taken up by the intellectual majordomos of the seventies. They joyously blended Marx with Freud, Capitalism with Schizophrenia. They wrote about the "lusting machines,"* the Libido of Economics.** They too were in search of a new language which did not repress utopias, desires, dreams; of a political sensitivity they theorized while, out there in the country, some lived it.

Somewhere at the intersection of the country and the city, the politics and the senses, the realities and the dreams, the tradition and the revolution, the rural practice and the urban theory, the young and the old, there was a fusion, a reconciliation of politics and desire – the Ecology Movement.

TO A GREEN CANDIDATE who handed him one of his leaflets, an old man with a broad child-like smile whispered: "I will vote for you. So that those parking meters be replaced by chestnut trees. But, above all, to piss off all the parties!"

According to a poll taken by the weekly magazine, *L'Express*, 55% of the Green electorate voted for an ecology candidate because he or she was not backed up by any traditional party.

Tired of party-imperialism in their politics, many French have felt that a Green vote allowed them to at last express their nebulous dreams which the party-apparati had urged them to abdicate in order to conform to repetitive historical models. Denying all affiliation with the Right, Brice Lalonde† remarks that "ecology is an anti-technocrat movement" but that "technocracy is not the monopoly of the Right." Another ecologist who is also a sociologist, describes the language spoken by the traditional left as "mechanized, saturated, castrating."

The politicizing of the ecology movement in 1974 launched a two-fold controversy. Why did the ecologists enter the political arena and should they have done so? Why did they run on an independent ticket, instead of integrating their program into the traditional left to which, at least in principle, they seemed to belong?

ICI ON CONSTRUIT LE SOCIALISME
W.C

Here one builds socialism

It was not until 1971, with the creation of the French version of "The Friends of the Earth" and later with the birth of groups like "Ecology and Survival," and "Pollution-No," that the movement, whose recurrent symbol was, until then, the apolitical butterfly chaser, started to split in two. Behind remained the nature-traditionalists who charged with heresy those who radicalized their fight for the protection of the environment. Ahead marched these new ecologists who claimed that the capitalist mode of production was responsible for the killing of little birds, and that Ecology *was* Politics.

Once the principle of "political ecology" was admitted, another question was raised from within the sphere of traditional politics (or what the ecologists were to call, later, "politician politics"). The Right was not yet concerned, as it would be later when the movement would be quantitatively important enough to influence the voters on the second ballot in favor of one end of the political spectrum or the other. But the Left was worried. After all, Dumont had been and was still an old socialist militant. He had made a name for himself denouncing the vile exploitation of the third world by the developed capitalist societies. And he was in the Left tradition when he repeated that no profit-based political system could solve the environmental problems that his campaign was raising. Why wasn't he using the predictable Left terminology? Urged by the press to do so, Dumont said the words: Yes, he was a socialist but not a traditional socialist. What he was fighting for was not state socialism with its centralized bureaucracy, but a "self-governed" (in French, "*autogéré*") and "poor" socialism. In brief, a "*socialisme d'austérité*," which would contest the principle of unlimited growth and make sure that the workingclass, when it holds the reins of power, fights to protect the interests of the biosphere. The Left was half-reassured: it assumed Dumont was a by-product of itself. Besides, with 1.3% of the votes, he was not very threatening.

But as the years passed the Greens did not stop improving their scores and they have risen to become a true political force – not only because they have spread throughout France and have come in third in some cities (right after the slates of the Left coalition and the Right majority) but because the way they

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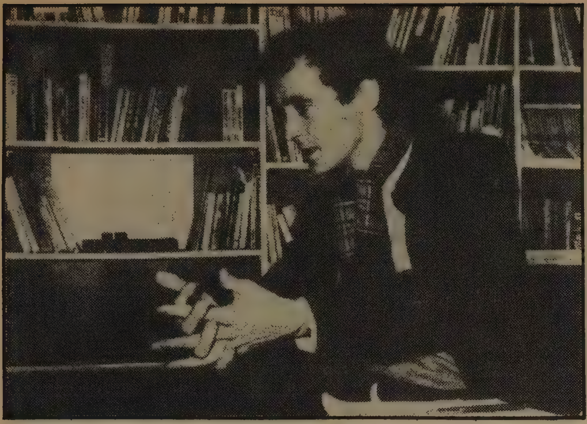
* In L'Anti-Oedipe, by G. Deleuze et F. Guattari.

** L'Economie Libidinale, by J.F. Lyotard.

†Brice Lalonde is a member of the "Friends of the Earth," a journalist for *Le Sauvage* and a Green candidate in the 5th district of Paris in 1976.



Brice Lalonde

vote on the second ballot determines the standing of the major parties.

At this point of their electoral "adventure," the Greens rarely represent more than 12% of the electorate in the cities where they run. Right after the first Green "peril" of the 1976 county elections, the Government and later the Parliament, adopted an electoral reform which constitutes a major institutional obstacle for the Greens: only if they obtain 12.5% of the votes (instead of 10% as before) are the candidates allowed to run on the second ballot and play the decisive role of referee between the Right majority and the Left opposition.

This accounts for the Green tone of the last municipal elections. Both the Left and the Right have gone "green-hunting." Jacques Chirac, a Gaullist Mayor of Paris, co-opted the Greens' vehicle. "The bicycle is an instrument of freedom," he said, adding, "I have been for fifteen years a member of the Association For the Defense of Pedestrians." The Communist Party, equally demagogic, printed a tree on its bill-board posters.

But the Greens have refused to play the game. As Brice Lalonde put it, "With the leaders of the Right the communication is definitively cut off. That leaves the Left. We won't accept nor perform any blackmail. We just won't play with it." Saying that he is not responsible for his supporters' votes out of respect for their freedom of choice, Brice Lalonde, like the majority of the Green candidates, refuses to endorse any specific candidate for the second ballot or to withdraw in favor of any one of them. The Green voters will thus vote as they please, without any voting directive from headquarters.

This problem of electoral behaviour on the second ballot has created internal divergences within the ecology movement. René Dumont, although he specifies that he speaks here as an individual person and not as the spokesman for any ecology group, expresses his view on the problem. "We must, we want to have an influence . . . but on the Left, not on the Right . . . We don't have any choice, we can only look towards the Left even when we strongly disapprove of its attitude . . . That's why, on the second ballot, however reluctant I might be, I choose the best of the Left."

Today, in the cold blood of post-election time (to last only a few months because the Greens have announced their omnipresence in the legislative elections of March, 1978), the Greens are at work to define their identity. And from the confrontations between magazine editors, sociologists, psychoanalysts, Left politicians, Green militants and the masses daily interviewed in the streets as well as from the ever-changing spectacle of the surrounding realities, there emerges the vision of the ecology movement as a new language not parallel to but beyond the manicheist speech delivered by today's politics, endowed with an ontological dimension and analogous, in its revolutionary potential, to the concept of political economics in the 19th century.

Alain Hervé, the editor of the widely read ecology magazine, *Le Sauvage*, (which is published by the Socialist weekly *Le Nouvel Observateur*), writes editorially, "Without wanting it, ecology has taken over socialism." And Brice Lalonde adds that the society envisioned by the Left Coalition partakes of the same "capitalist" spirit as the one protected by the Right Majority. "It will remain the same industrial society, centralized, concentrated, technocratic . . . anti-ecological. It will keep its two unbearable characteristics: "heteronomy" (the opposite of autonomy), and capitalism – in the conceptual meaning of the word: accumulation, production on a larger scale, and faster and faster turnover of capital."

These two statements indicate the position that the ecologists seem to hold today on the French political spectrum. The Right has been erased, and they are apart from the Left (more precisely, as René Dumont specifies, "far on the left of the Left").

Originally, for the Greens to enter the political stage was merely a way to broadcast their ecological concerns and put pressure on the Left coalition so that it would integrate a quantitative criticism of growth with its qualitative goal of ownership transfer from the private to the public sector. They had hoped that the socialists at least would be ready to balance their fight for power with a parallel re-evaluation of the substance of this power. But the traditional Left only intermittently became "Greenish" and then merely for electoral purposes. The more the ecology movement tried to dialogue with the Left coalition, the more it realized that the dialogue was closed. The Greens' ideals clashed with the Left notions of industrial "productivism," concentration of tools, political centralization.

But the major point of disagreement was the problem of nuclear energy and armament. "We will not renounce any form of energy," François Mitterand said at a Socialist conference. In July, 1977, however, the Socialist leader suggested timidly that the French should be consulted on nuclear power via a referendum. This was right after the violent clashes between the police and demonstrators when thousands of antinuclear protesters gathered in Malville (in the southeastern province of Isere) to oppose the construction of the nuclear generator, "Super-Phoenix." The

Communists immediately answered that they were violently opposed to such a referendum. In updating the Left Coalition's program, the Socialists stress that for now, nuclear weapons will be maintained. The Communists chose to reinforce their emphasis on nuclear energy.

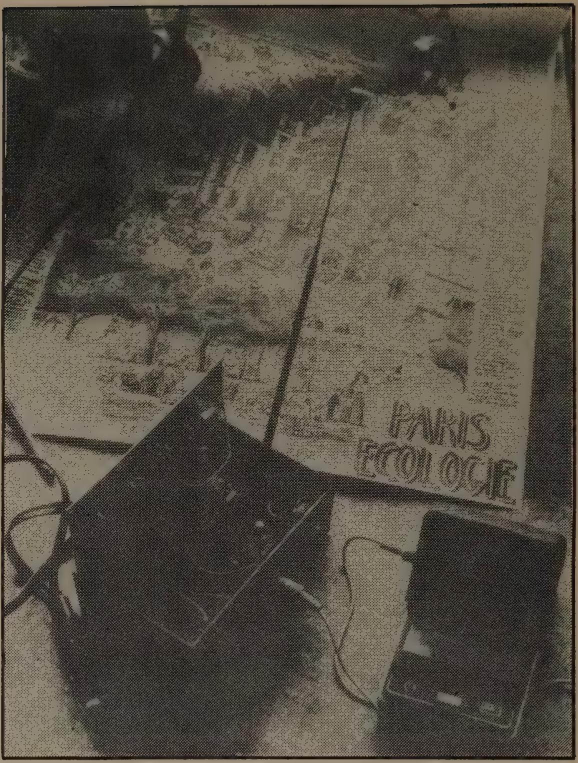
STRETCHING EVERY DAY a little more the umbilical cord which keeps them attached to the socialist Left, the Greens are busy organizing their "autonomous political presence" in the coming legislative elections. They have already presented several platforms which converge around the following concepts.

Based in the middle-classes (especially farmers and middle-income workers) and highly supported by the professional classes (intellectuals and industrialists), the ecology movement is a social cauldron of heterogeneous groups such as the autonomists, the anti-nuclear militants, the consumers, the non-violents, the concerned scientists, the anarchists, and the women's associations. It is thus to respect the diversity of their electorate that the ecologists have made the concept of "auto-gestion" (decentralized self-government) the central and common point of their programs. As Brice Lalonde explains it, "auto-gestion" is the application on the human and political scale of the "auto-regulation" (self-regulation) of the ecosystems which owe their stability to their diversity. In Green politics, nature replaces the state and the planning role that the Common Market plays, "To the great satisfaction of the ecologists," Brice Lalonde rejoices, "auto-gestion becomes a law of nature." And noting that human beings are part of ecosystems, he rejects the accusation of "ecofascism" (fascism of nature over man) often thrust at the ecologists by their detractors.

Inspired by Ivan Illich, the Greens are urging for a decentralization of human "tools" (that is to say man's techniques and institutions) copied from the inherent decentralization of nature's tools. Against what they call the "farce of contemporary democracy," they propose to restore local democracy and endow each local community, each individual, with full powers of decision. Real "regional power" will be restored to the provinces and citizens won't be fooled any more by the practice of "power delegation" which is the base of the French parliamentary system.

ON THE NIGHT of the municipal elections, the Greens thanked their numerous supporters with this promise: within two months they would broadcast the first programs of "*Radio Verte*" ("Green Radio"), an ecology pirate radio station.

Two months later, on May 13, from an apartment on the Place des Vosges, a haven of peace in the heart of the capital, the first Green voice is heard on the radio-waves of Paris: "Green radio, local radio, first broadcast, ecology manifesto . . . Green radio, pirate station . . . what will we broadcast . . . where . . . when . . . whom for . . . what for . . . to say something different . . ."



A radio-verte *neighborhood transmitter*

Thirty-seven minutes of broadcasting: a total success. To evade suppression Radio Green had been previously announced, discreetly, for an incorrect date and a different wavelength. A few minutes before the beginning of the broadcast, balloons were launched over Paris carrying a wooden box which read "Green radio." Two minutes before, the official networks carried the news in their evening bulletins. Green-radio broadcasts: a little music; interference with some suburban radios, for the fun of it; a few remarks by some well-known ecologists. Not much substance that first evening – the importance was to broadcast the idea of free radio, to claim existence on the air waves. "Our purpose is not to add words to other words, institutionalized speeches to non-institutionalized speeches . . . We want to urge people to do something else . . . urge them to walk off the beaten track."

The Greens had recorded enough material for fifteen days of regular broadcasting. They had worked for two months nonstop to achieve a harmonious synthesis between the expertise of their technicians and the amateurism of their producers and to raise enough funds for the buying of a Braun-Boveri transmitter, which had to be technically modified not to interfere with taxi-radios, planes, and ambulances.

Three days later they were back and so was their audience, feverishly waiting for the second broadcast of Radio Green. But nothing came on the air, nothing but a suspicious purring. The transmission had been jammed. The Green looked up: a red police helicopter was flying over the building. Since then, Radio Green has been silent.

Obviously, orders were given from the top to the managers of the telephone companies and the official radio and television networks. They were supposed to jam the first transmission of Radio Green but they did not expect the first broadcast which had been announced for a later date. They did not miss the second one.

There has been a conspiracy of silence among police officials. "Of course we never tried to jam Radio Green. It's just that the transmitter of the ecologists was defective." And they've even led their own pseudo-ecological campaign by accusing the Greens of trying to pollute the radio waves.

ON THE ONE HAND an attempt to speak; on the other hand, an attempt to silence. But it is only the first round of the battle. The Greens will come back on the air; their survival is at stake. After their success in the municipal elections, the Greens needed to consolidate their still-nebulous force, to give it a skeleton. "We will never become a political party," said Brice Lalonde. It would be contrary to the principle of decentralized politics. Radio Green emerged as a means to avoid the risk of totalitarianism which is present behind the scenes in any election. The electoral emergence of ecology leaders was to be dissolved in the resurgence of the faceless nobodies . . . The microphone would be handed again to the district committees so that they could build, from the local bases, the future of the movement.

Radio green: it was a means, too, to achieve "autogestion" and fight, on another level, the concept of monopoly. The Greens would generate their own organ of broadcasting which would serve as a two-way communication process between the ecologists scattered around Paris. A seductive alternative to the centralized headquarters of the traditional parties.

With a touch of irony, Radio Green has delineated its future action: the creation of an Association for the Liberation of the Airwaves which would define the conditions for destruction of the state monopoly, not to repeat the Italian mistake – the jamming of the public air waves and an advertising anarchy. They have added, too, that they will jam the jammers. When the jammers are all jammed, then maybe the negotiations can start.

Wavewars . . . There are many war reminiscences these days about the Greens. Radio Green was the first radio to be jammed in France since Radio London was jammed during the German occupation. And commenting on this summer's demonstration in Malville, which attracted many German anti-nuclear militants,* the Administrator of Isere said with tears in his eyes: "For the second time in my life, I've had to witness the invasion of France by the Germans."

One is a dying war, fought with crumbling weapons of repression. The other is a new-born war, fought with subtler weapons, of life. ■

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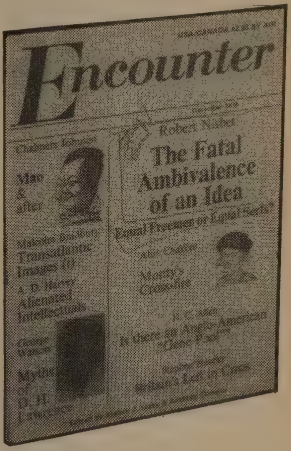
* The construction of "Super-Phoenix" is a joint-project of the governments of France, Italy and Germany.

Encounter

The writing is impeccable and there is no other forum in English that has so much intelligence on the issues inherent to human freedom and the continuing conduct of worthwhile civilization. A couple of hours with a copy is rather a cleansing experience; piles of garbage shoveled from the mind, leaving a neat workbench indeed. Perhaps its greatest value to a parafreak reader is the devastation it makes of the simple-minded, self-righteous fixations that characterize so many quasi-educted liberal "project people." The ground of love, wit and understanding in the adventure is complex stuff and a lot of work to tend, vastly more than a peasant culture can tend on a planet of 8 billion. We've aristocratic problems and any further embarrassment over it is stupid.

—George Putz


Encounter
Robert Nisbet
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Freedom can die. As Goethe once wrote: "Lawgivers or revolutionaries who promise equality and liberty at the same time are either utopian dreamers or charlatans. . . ." But if the process is gradual enough, as it is likely to be in the free West, I am not sure very many people will even notice when the final line between a relatively free order and a collectivist servitude has been crossed. A few more years of egalitarian and redistributionist rhetoric, a few hundred more "entitlements," another million or so members of the centralised bureaucracy pledged to achievement of equal rations, equal housing, equal social esteem, equal strength and beauty, and how would one possibly know of the transition?

— Robert Nisbet

●

In the last century, we have increased our speeds of communication by a factor of 10^7, our speeds of travel by 10^2, our speeds of computer operation by 10^6, and our energy resources by 10^3. But all exponential growth reaches an *asymptote*, the ceiling limit, where it levels off. In terrestrial speed, there is a natural limit of 16,000 miles an hour, since any higher speed throws a vehicle out of the earth's orbit. In communication around the world, we have already approached, in telephonic, radio and television communication, "real time", and the technological problems are primarily those of expanding the number of bands of communication to permit more and more people to enjoy that use.

In a fundamental sense, the space-time framework of the world *oikoumene* is now almost set. Transportation and communication bind the world as closely together today as the Greek *polis* of twenty-five hundred years ago. The major sociological problem created by that technology is what happens when all segmentation breaks down and a quantum jump in human interaction takes place. How will we manage when each and every part of the globe becomes accessible to every person?

– Daniel Bell

Verily

. . . I would like to pass along the most enlightening comment I heard at a recent metrication seminar: "If God had meant man to use metric, Jesus would have had ten disciples."

Ken Shepard, Bybee, Indiana

The Goose and the Gander Were Talking One Night

BY R. CRUMB

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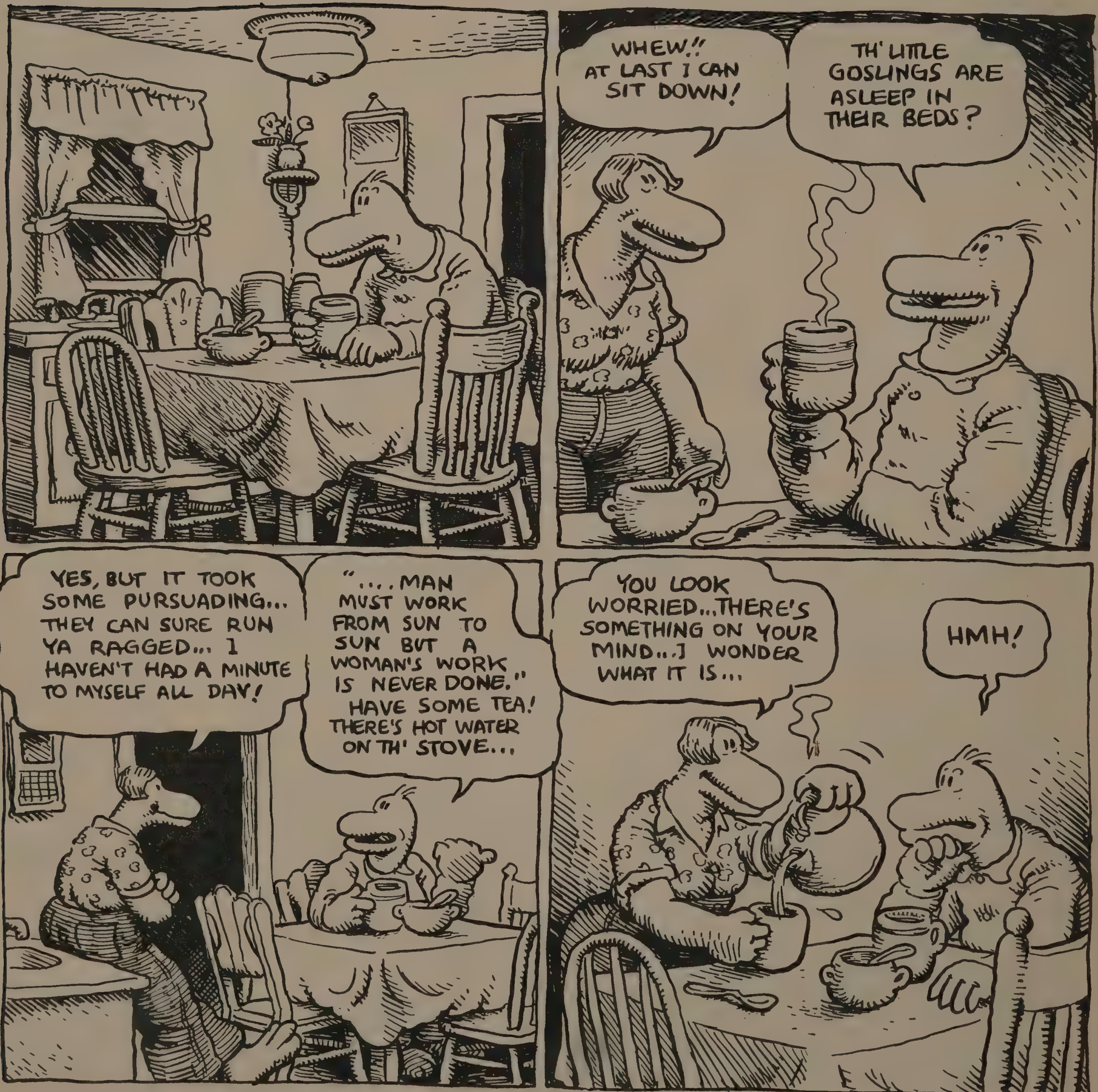
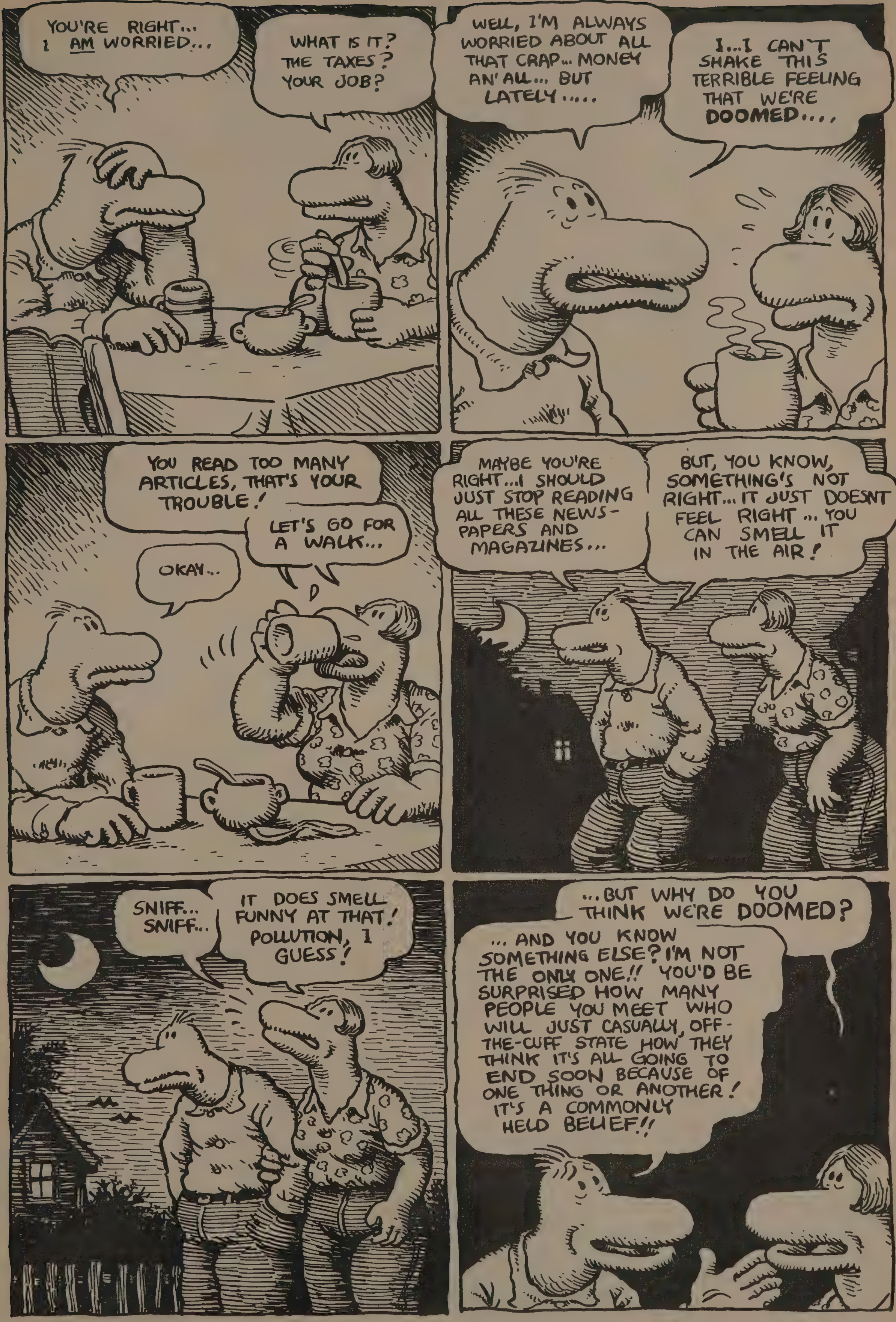
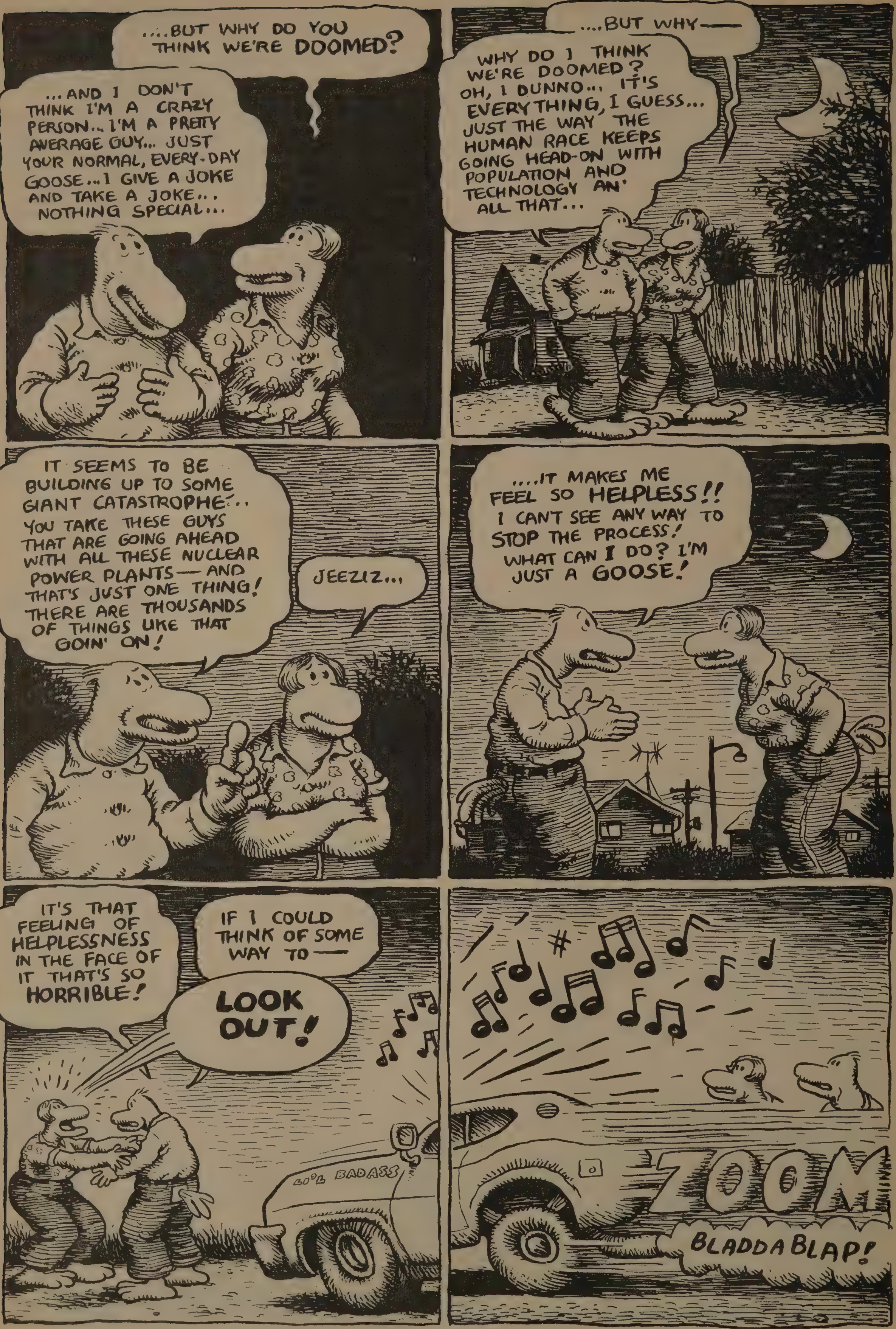
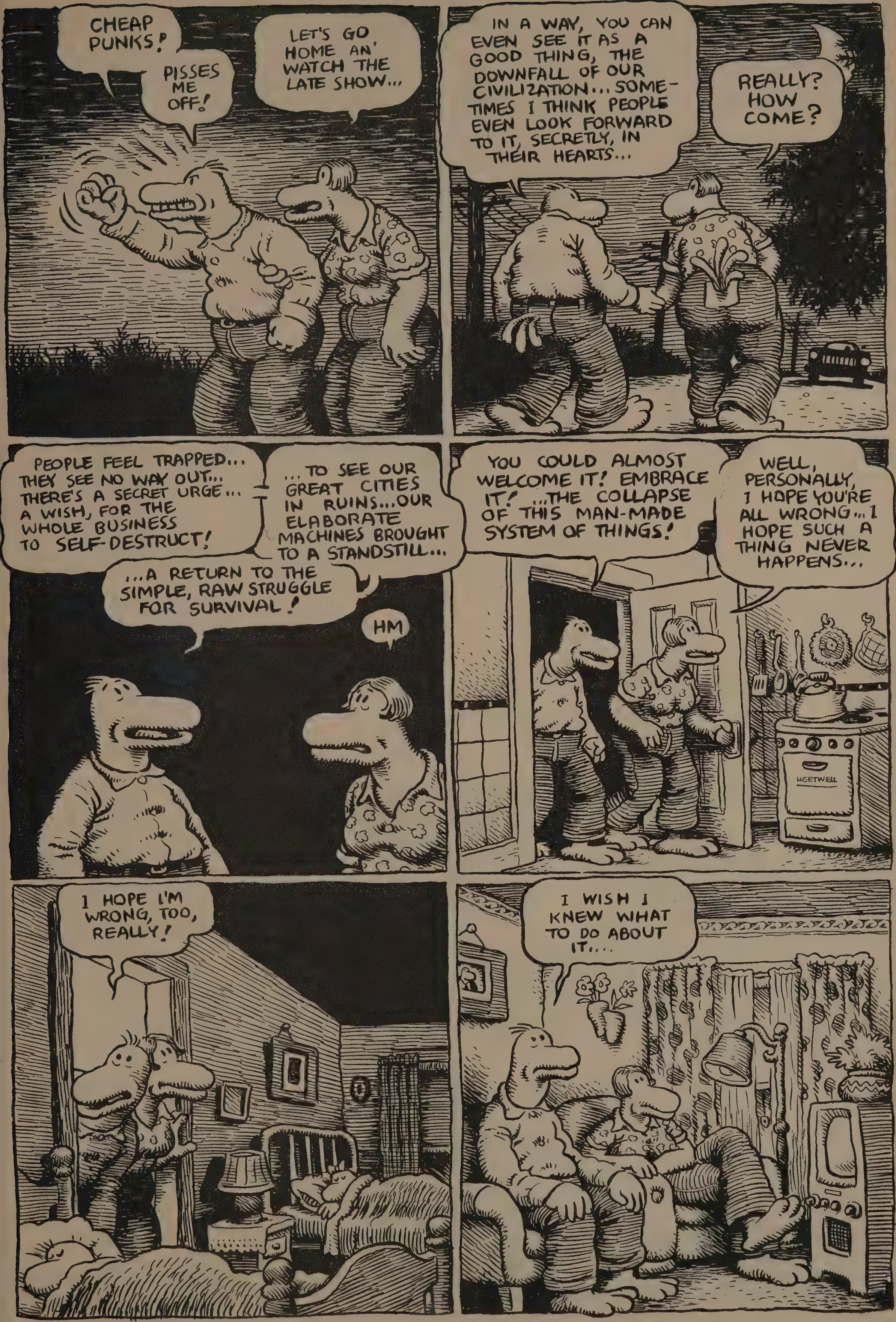

WHEW!! AT LAST I CAN SIT DOWN!
TH' LITTLE GOSLINGS ARE ASLEEP IN THEIR BEDS?
YES, BUT IT TOOK SOME PURSUADING... THEY CAN SURE RUN YA RAGGED... I HAVEN'T HAD A MINUTE TO MYSELF ALL DAY!
"....MAN MUST WORK FROM SUN TO SUN BUT A WOMAN'S WORK IS NEVER DONE." HAVE SOME TEA! THERE'S HOT WATER ON TH' STOVE...
YOU LOOK WORRIED...THERE'S SOMETHING ON YOUR MIND...I WONDER WHAT IT IS...
HMH!


YOU'RE RIGHT... I AM WORRIED...
WHAT IS IT? THE TAXES? YOUR JOB?
WELL, I'M ALWAYS WORRIED ABOUT ALL THAT CRAP... MONEY AN' ALL... BUT LATELY.....
I...I CAN'T SHAKE THIS TERRIBLE FEELING THAT WE'RE DOOMED....
YOU READ TOO MANY ARTICLES, THAT'S YOUR TROUBLE!
LET'S GO FOR A WALK...
OKAY...
MAYBE YOU'RE RIGHT...I SHOULD JUST STOP READING ALL THESE NEWSPAPERS AND MAGAZINES...
BUT, YOU KNOW, SOMETHING'S NOT RIGHT... IT JUST DOESN'T FEEL RIGHT... YOU CAN SMELL IT IN THE AIR!
SNIFF... SNIFF...
IT DOES SMELL FUNNY AT THAT! POLLUTION, I GUESS!
...BUT WHY DO YOU THINK WE'RE DOOMED?
... AND YOU KNOW SOMETHING ELSE? I'M NOT THE ONLY ONE!! YOU'D BE SURPRISED HOW MANY PEOPLE YOU MEET WHO WILL JUST CASUALLY, OFF-THE-CUFF STATE HOW THEY THINK IT'S ALL GOING TO END SOON BECAUSE OF ONE THING OR ANOTHER! IT'S A COMMONLY HELD BELIEF!!


....BUT WHY DO YOU THINK WE'RE DOOMED?
...AND I DON'T THINK I'M A CRAZY PERSON... I'M A PRETTY AVERAGE GUY... JUST YOUR NORMAL, EVERY-DAY GOOSE...I GIVE A JOKE AND TAKE A JOKE... NOTHING SPECIAL...
....BUT WHY——
WHY DO I THINK WE'RE DOOMED? OH, I DUNNO... IT'S EVERYTHING, I GUESS... JUST THE WAY THE HUMAN RACE KEEPS GOING HEAD-ON WITH POPULATION AND TECHNOLOGY AN' ALL THAT...
IT SEEMS TO BE BUILDING UP TO SOME GIANT CATASTROPHE... YOU TAKE THESE GUYS THAT ARE GOING AHEAD WITH ALL THESE NUCLEAR POWER PLANTS— AND THAT'S JUST ONE THING! THERE ARE THOUSANDS OF THINGS LIKE THAT GOIN' ON!
JEEZIZ...
....IT MAKES ME FEEL SO HELPLESS!! I CAN'T SEE ANY WAY TO STOP THE PROCESS! WHAT CAN I DO? I'M JUST A GOOSE!
IT'S THAT FEELING OF HELPLESSNESS IN THE FACE OF IT THAT'S SO HORRIBLE!
IF I COULD THINK OF SOME WAY TO——
LOOK OUT!
LI'L BADASS
ZOOM
BLADDABLAP!


CHEAP PUNKS!
PISSES ME OFF!
LET'S GO HOME AN' WATCH THE LATE SHOW...
IN A WAY, YOU CAN EVEN SEE IT AS A GOOD THING, THE DOWNFALL OF OUR CIVILIZATION... SOMETIMES I THINK PEOPLE EVEN LOOK FORWARD TO IT, SECRETLY, IN THEIR HEARTS...
REALLY? HOW COME?
PEOPLE FEEL TRAPPED... THEY SEE NO WAY OUT... THERE'S A SECRET URGE... A WISH, FOR THE WHOLE BUSINESS TO SELF-DESTRUCT!
...TO SEE OUR GREAT CITIES IN RUINS...OUR ELABORATE MACHINES BROUGHT TO A STANDSTILL...
...A RETURN TO THE SIMPLE, RAW STRUGGLE FOR SURVIVAL!
HM
YOU COULD ALMOST WELCOME IT! EMBRACE IT! ...THE COLLAPSE OF THIS MAN-MADE SYSTEM OF THINGS!
WELL, PERSONALLY, I HOPE YOU'RE ALL WRONG... I HOPE SUCH A THING NEVER HAPPENS...
HOTWELL
I HOPE I'M WRONG, TOO, REALLY!
I WISH I KNEW WHAT TO DO ABOUT IT...

Charles Ross is an artist who works with light — specifically, sun and starlight. In the '60s he was known for his arrays of giant prisms that spattered brilliantly-colored shards of rainbow across nearby surfaces and spectators with de-lightful abandon. Since then, he has shifted his attention to the unravelling of evidence — contained in the light itself — of the large-scale spatio-temporal relationships that govern our reception of celestial light here on earth. His Equinoctial Year project, briefly summarized on these four pages, marked the beginning of the shift.

Flat photo-images, like the one on the facing page, can barely suggest the vivid sensuality of the burns. They are etched deep into the wood, charred and fissured canyons, rimmed in places with delicate halos and wisps of soot. They are graphic demonstrations of solar power and the vicissitudes of weather, and the effect of seeing the whole year's worth at once is quite spectacular.

The material presented here is adapted from Ross's elegant, large-format book, **Sunlight Convergence/Solar Burn,** *which was published last year by the University of Utah Press (40 pp., available from the University of Utah Press, 1400 East 2nd South, Salt Lake City, Utah 84112, or the John Weber Gallery, 420 West Broadway, New York, NY 10012; price $20.)*

Ross, 40, lives half the year in New Mexico and the other half in New York City. *—Robert Horvitz*

SUNLIGHT CONVERGENCE/ SOLAR BURN

A Solar Narrative Drawn Across 366 Wooden Planks by a Focused Point of Sunlight

BY CHARLES ROSS

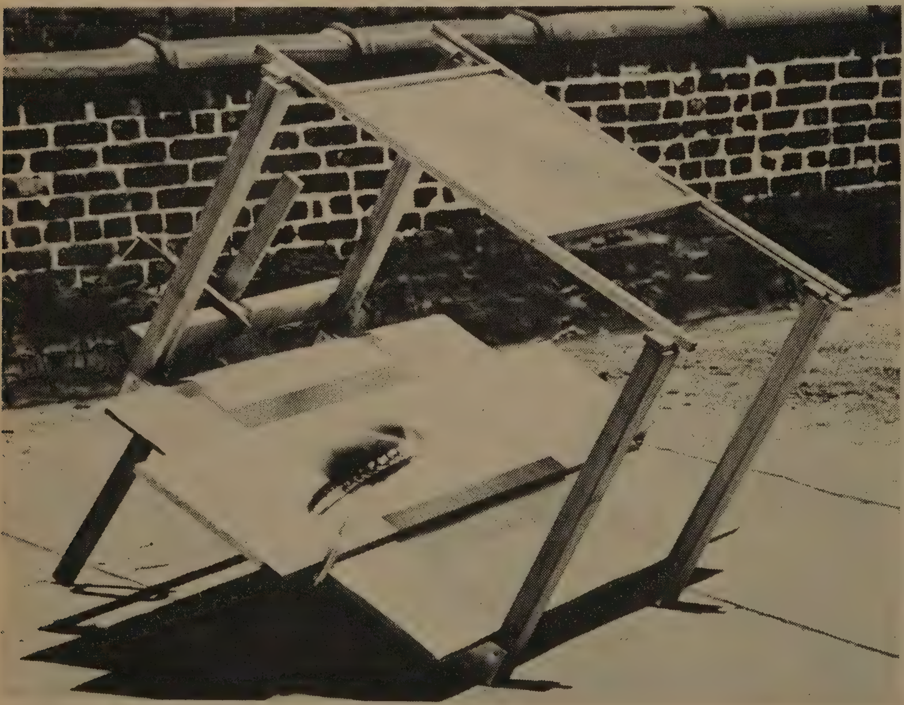
The Equinoctial Year: September 23, 1971 through September 22, 1972

Each day for one year, I placed a wooden plank at the focus of a large stationary lens. As the sun passed across the sky, the concentrated power of its rays burned the day's signature along the plank. In the evening the burn was collected and a new plank was set in place. As the cycle continued, it became ritual: the evening harvest of solar forms.

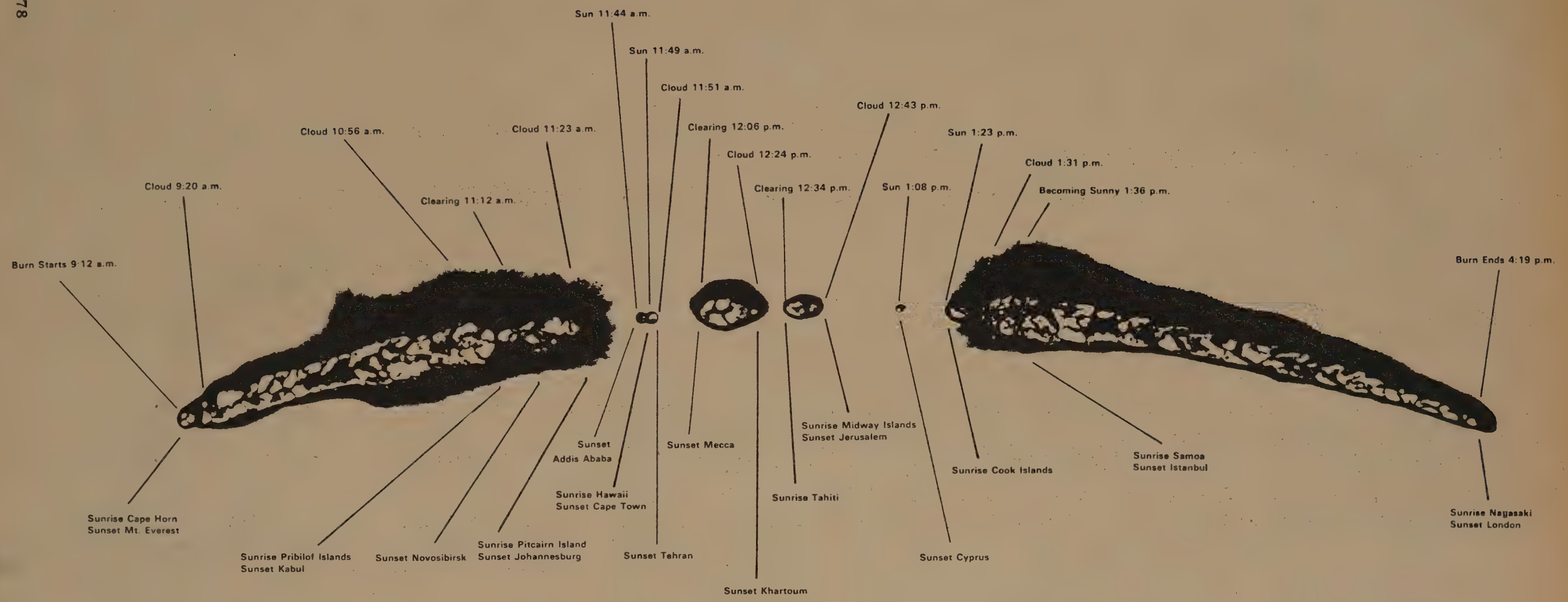
Varying cloud conditions punctuate each burn. Bright sunlight leaves a broad smoke flare. Passing clouds cause unburned interruptions. Overcast days produce blank boards. The length, width, and depth of each burn is affected by atmospheric conditions such as haze and smog.

White light to charred matter. Primal forces captured by the primal camera. Energy to image; regulated thru the fluctuating iris of weather, drawn along the board by the rotation of the earth, segmented by the alternation of day and night. The work could not be made. It had to be derived directly from the source. A window was built so that cosmic elements would reveal themselves.

The artist as catalyst — precipitating form without interference or interpretation. The burns are not information about, but rather a point of contact with their source. They look beyond the notion of art as a closed system to propose art as a point of contact with the universe energy matrix.

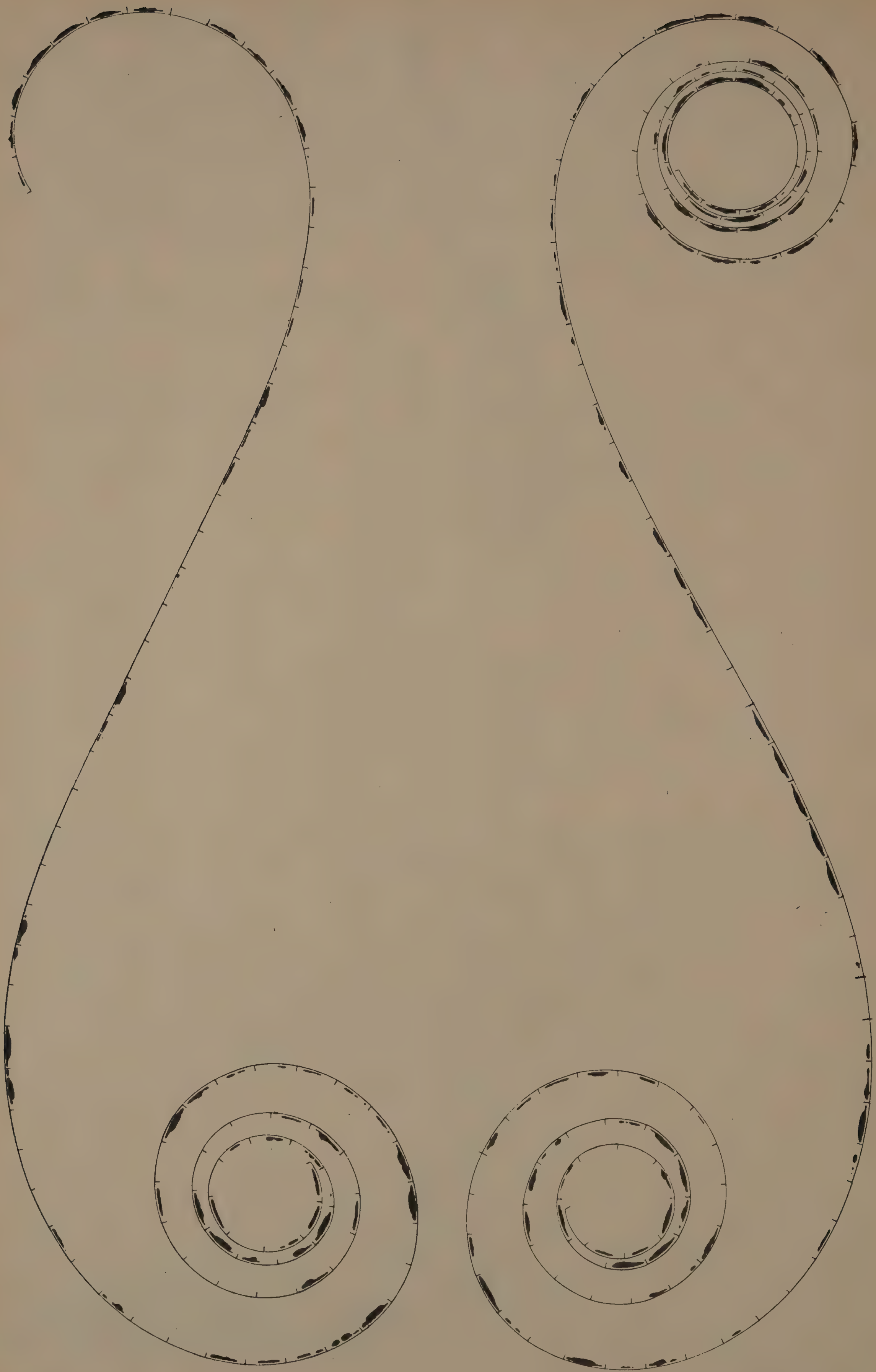


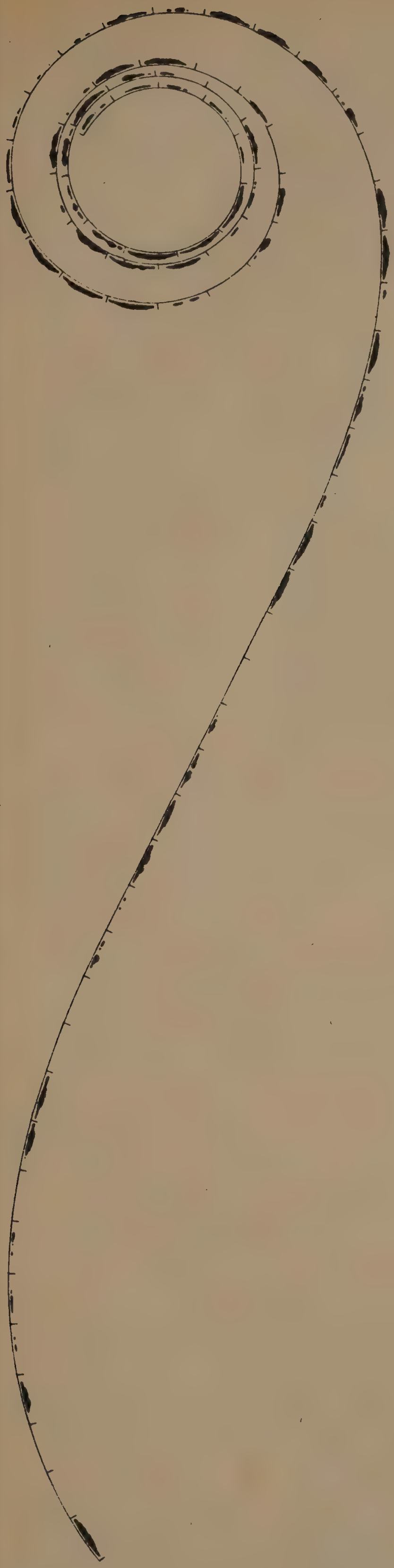
The tools: A flat Fresnell lens measuring 19 X 25 inches with a focal length of 24 inches. Each night a wooden plank was centered under the lens in exactly the same position. The plank measured 1 X 5 feet and was 3/4 of an inch thick. The wood was fireproofed so that it would burn at the focused point of light but would not flame or "catch fire." It was coated with a special white paint that would hold traces of the smoke plume. The apparatus was attached by hinges to the roof of 80 Wooster St., Manhattan, New York, so that the lens faced south and could not be turned in an east-west direction. Occasionally, as necessitated by the seasonal change in the sun's altitude, the lens assembly was tilted (at night) so that the burn would remain centered on the board. The setup was not moved or touched during the course of a single day's burn.



July 1, 1972, New York City

[more→]





The Year Shape

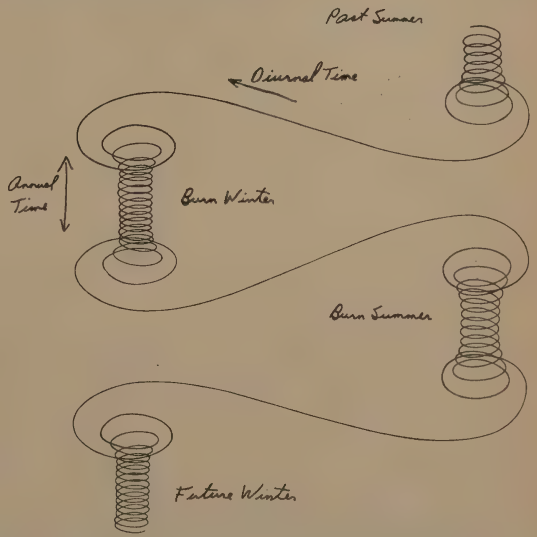
The curvature of the burns varies with the seasons, reversing from winter to summer and straightening near the beginning of spring and fall. I first noticed the changing curvature toward winter; the burns were becoming concave and seemed to contradict the daily arc of the sun across the sky, which is always convex. However, the curvature of the burns is not drawn by the rotation of the earth on its axis, but rather by the motion of the earth around the sun. It seemed that if the 366 burns were placed end to end following their actual curvature, they should form an S shaped curve similar to a plane projection of the ecliptic, the S shaped path of the sun seen on many star maps.

I had noticed that the burn curvature was not always exactly aligned with the ecliptic, but attributed this divergence to a lack of precision in the lens set-up and I was curious to know how it would affect the shape of the year. Since the burns would cover over a third of a mile if laid end to end, they were scaled down in photographs and I began constructing the curve using a length of spring steel wire to follow their day to day continuity. The resulting shape was a complete surprise.

The year shape is a double spiral which rapidly closes down to a circle around the winter solstice and then spirals open, straightening into spring. Curving more slowly in the opposite direction, it curls around the summer solstice, then spirals open again to straighten into fall.

Far from being imprecise, the burns had captured subtle and ordinarily imperceptible elements of the earth/sun system. The "quality" of the curvature in the burns — concave, convex, or straight — belongs to the ecliptic. But the specific degree of curvature, and the amount it changes from day to day, belongs to the position and speed of the earth in its orbit. During New York's winter, the earth is closer to the sun and consequently is traveling faster through space than it is in summer. This change in speed is reflected in the winter burn spiral which closes more rapidly and tightens into a smaller circle than the summer spiral.

Through the medium of a lens, sun light and earth elements were brought together and a previously unknown solar form materialized. The image was contained in the light, not in the materialization process. Drawn by the sun itself, the burns reflect the forms, forces, dimension, and time scales of the energy that made them. ■



The year shape in three dimensions. This may be viewed as a materialization of two different kinds of time: diurnal time, the succession of days winding across the horizontal plane, and annual time, the vertical stacking of the seasons.

Ethical Technology *by Michael J. Goc*

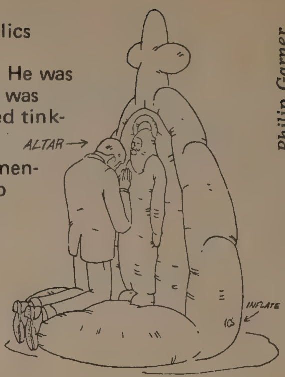
It was interesting to note both Lynn White's and Michael Foley's attempts to tie environmental destruction to theology ("Who Cut Down The Sacred Tree?" in Fall '77 CQ). For it is technology that destroys, technology that transcends theology, ignores it, whether it be activist-oriented North European Protestantism or the contemplative Buddhism of South Asia.

All theologies provide an ethical system, and by its very nature, ethics implies restraint. There is always a set of guidelines by which humans may act. This is not true of technology, whose only ethic is that there is none, save the practical. If something can be done, it will be done, without any ethical taboo.

The Catholic monk wielding his axe, biting into the holy oak of Teutonic Europe, is a perfect symbol. He was able to do so because the technology of his time enabled him to. He felled the wooden giant because he swung an iron axe. The Germans revered the massive oak, a theological holdover from the days of Stone Age technology. Ever try to cut five feet of oak with a stone axe? No wonder they revered it. But when Brother Boniface hefted his iron, the tree came down and with it German paganism. The question is whether it was Boniface's theology or his technology that altered Teutonic religion. Was it the magic of his message or the medium, the axe, the technology?

Foley states that medieval Christianity possessed an ethic of nurture, of conservation. Perhaps it did, but only because medieval society did not possess the chain saw or the bulldozer, or even the windmill until the late 1100's. The fact is that European man, Asian man, African man, utilizes and/or destroys as much of his environment as his technology empowers him to. Primitive societies slash and burn until something more sophisticated comes along. More forests come down when the axe is put aside for a water-powered mill and even more come down when that tedious invention is made obsolete.

In addition, Foley's idea of Christ the Great Architect, fostering conservation of resources, is off base. In the medieval view Christ was also the Great Butcher, Baker and Candlemaker. He was at the peak of society's pyramid and the center of its world. (Catholics always mix metaphors when talking about their god.) He was the Great Architect because he was the Great Everything — a deified tinkerer, the first generalist.



Philip Garner

The modern period of environmental destruction is usually said to have begun with the Industrial Revolution of the nineteenth century, when technology became sophisticated enough to do its utmost dirt. Very conveniently, says Foley, the anti-Catholic Enlightenment provided the new industrialists with the rational philosophy they needed while Protestantism, especially English Puritanism obliterated the last remnants of the medieval ideal. Balderdash. Technology provided the industrialists with the means to destroy their environment and they did so, without philosophizing a wit. It didn't matter whether theology had been altered. It was simply ignored. The idea was and still is that if it can be done, it will be done; better, it should be.

It seems that no matter what course of human action is debated, the technological argument that states it should be because it can transcends any ethic. The space program, Alaska pipeline, nuclear power plants, neutron bombs, deep sea mining, anthrax bombs, all come about not because of an ethical decision. Instead they occur because of the overwhelmingly non-ethical technological argument. The wonder is that the nuclear holocaust has not occurred in the thirty-two years since Hiroshima. (This inhuman restraint counters much of my argument. But I can wait forever to be proved correct.)

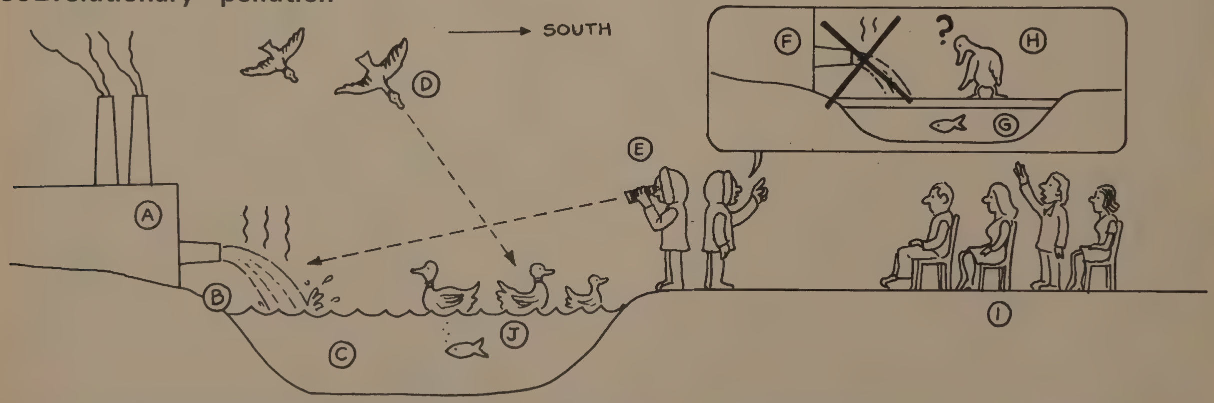
What is needed is not a theological ethic, but a technological one — a system of restraint whereby technological man says, just as theological man does, "Even though I can do this, I must not." Who has read history and not seen technology proceed unhampered by theology? The idea of blaming environmental destruction on religion is specious. For when technology proclaims the possible, theology is ignored. ■

A remark from Lynn White, Jr.

[Who wrote "The Historic Roots of Our Ecologic Crisis" in 1967.]

As the inadvertent founder, it would seem, of the Theology of Ecology, I confess amusement at the speed with which the Churches have abandoned the old scion of Man's Dominion over Nature for the equally Biblical position of Man's Trusteeship of Nature. Since the Churches remain, despite some competition, the chief forges for hammering out values, this is important. I feel that before too long, however, they will find themselves going on to the third legitimately Biblical position, that Man is part of a democracy of all God's creatures, organic and inorganic, each praising his Maker according to the law of its being.

CoEvolutionary "pollution"



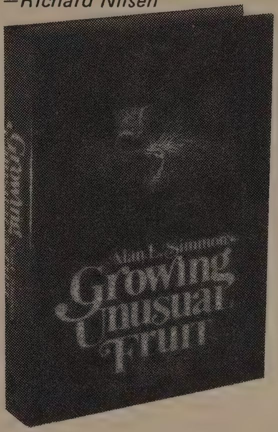
Rochester, Minnesota electric plant Ⓐ discharges water 15 - 85 degrees warmer Ⓑ than Silver Lake Ⓒ causing lake to remain open during winter. Canadian geese Ⓓ (including subspecies once thought extinct) sight open water on way south and winter in lake. Pollution Control Agency Ⓔ notes plant's exceeding PCA warm-water discharge regulation and calls for 3 degree limit Ⓕ which would cause lake to freeze Ⓖ confusing goose Ⓗ who has been coming to lake for years and resulting in public hearing Ⓘ to decide whether presence of geese outweighs the effects of thermal pollution on fish life Ⓙ and water quality.

—Paul Kokesch
Janesville, Minnesota

Growing Unusual Fruit

An illustrated reference work aimed at the home gardener rather than botanists. Close to 100 varieties from around the world are covered, with the plant history and cultivation instructions generally better than the information on cooking and eating. Since one man's rarity is another's commonplace, the varieties covered are a bit surprising — "common" fruits like oranges, bananas, almonds and olives, along with "rare" species like buffalo berry, manzanita, prickly pear and water chestnut. Directions on greenhouse cultivation for tropical fruits are included, which is a help.

—Richard Nilsen



Growing Unusual Fruit
Alan E. Simmons
1972; 354 pp.
$10.00 postpaid
from:
Walker and Company
720 Fifth Ave.
New York, NY 10019
or Whole Earth

CONTENTS

Akebia fruit
Almond
Alpine strawberry
Appleberry
Applerose
Apricot
Avocado pear
Banana
Barbados cherry
Barberry
Bilberry
Blueberry
Brambleberry
Brazilian cherry
Buffalo berry
Cape gooseberry
Carambola
Casimiroa
Checkerberry
Chequers
Cherry plum
Chinese gooseberry
Cloudberry
Coffee bean
Cornelian cherry
Cranberry
Crowberry
Custard apple
Custard banana
Desert plum
Elderberry
Eve's date
Feijoa
Fig
Fuchsia berry
Goumi
Grape
Guava
Guelderberry
Holboellia
Hottentot fig
Huckleberry
Japanese quince
Jujube
Juneberry
Killarney strawberry
Kumquat
Lemon
Lime
Litchee
Loquat
Mandarin
Mango
Manzanita
Marmelos
Mediterranean medlar
Medlar
Mombin fruit
Monstera
Mulberry
Nectarine
Olive
Orange
Oregon grape
Passion fruit
Paw Paw
Persimmon
Pineapple
Pomegranate
Poncirus
Prickly pear
Pummelo
Quince
Raspberry — black, purple, yellow
Rowanberry
Sea Berry
Snowberry
Strawberry-raspberry
Sugarberry
Tree tomato
Twinberry
Ugni
Umbinza
Water chestnut; Singara nut
Wineberry
Worcesterberry
Zabala fruit

The Marugg Company

The Marugg Company sells hand scythes imported from Germany and Austria, and hickory snaths (handles) from Tennessee. Christian Marugg began the business in 1873, after immigrating from Switzerland; two men make the handles and fill the orders today.

The blades are sharpened by hammering on an anvil, not by grinding. Also available — grass scythes for haying from 20 to 30 inches in length, plus heavier weight bush scythes for chopping briars or clearing irrigation ditches.

—Richard Nilsen
[Suggested by Wendell Berry]

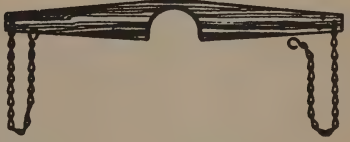
The Marugg Company
price list
Free

from:
The Marugg Company
Box 326
Tracy City, TN 37387

Austrian Grass Scythes

20 inches long	—	$14.00	26 inches long	—	$14.65
22 inches long	—	$14.25	28 inches long	—	$14.75
24 inches long	—	$14.35	30 inches long	—	$14.90

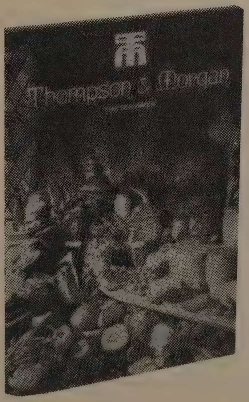
Snath curved — $6.50



No. 93 — Wateryoke (Wasserjoch). Most useful in carrying full pails without spilling. Water from the spring, slop to the pigs, milk from the dairy barn, water or liquid manure to the growing plants. A thousand uses on every farm. Made of best hardwood, galvanized carrier chains. Has special device for regulating the load forward or backward. Length 40 inches; weight about 5 lbs. Price $4.50.

Unusual seed catalogs

Thompson and Morgan
P.O. Box 24
401 Kennedy Blvd.
Somerdale, New Jersey 08083



This is the catalog for hard to find seed, including loofah, passion fruits, Chinese and other exotic vegetables, as well as common vegetables, herbs, and flowers.

•

Otto Richter & Sons Ltd. Herb Catalogue
Goodwood, Ontario LOC 1AO
Canada

Ancient and common herbs; 8 varieties of basil; carob; belladonna; and even dye plants

•

Horticultural Enterprises
P.O. Box 34082
Dallas, Texas 75234

29 varieties of chili peppers and a handful of Mexican vegetables in a catalog that's really a poster.

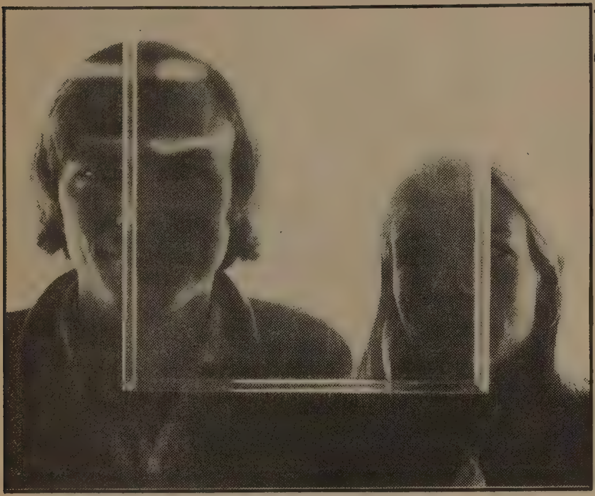
—Rosemary Menninger

BUILDINGS AS ORGANISMS

BY DAY CHAHROUDI

Suntek Research Associates
500 Tamal Vista Blvd.
Corte Madera, California 94925

Molecular soft technology: Heat Mirror, Cloud Gel, and Thermocrete



Brand

Looking through a pane of HEAT MIRROR mounted 3/8" from a glass window are John Brooks and Sandy Jones of Suntek. Though transparent, the HEAT MIRROR has the heat-containing properties of 1 inch of foam insulation.

Heat Mirror

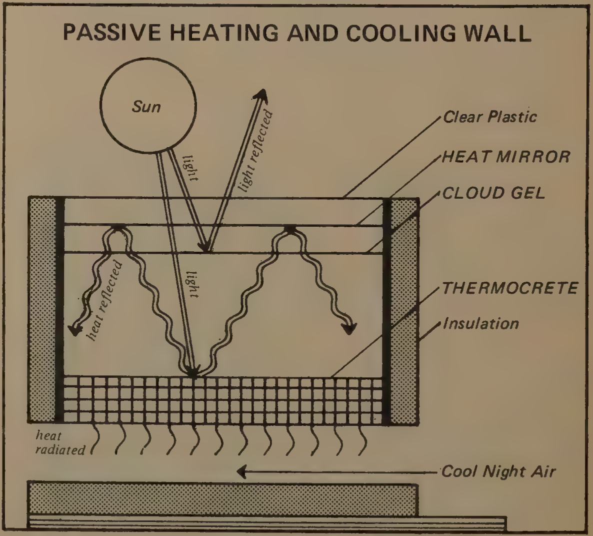
Imagine an insulating material which is also transparent to light – it sounds like a contradiction in terms. Such a material would prevent the flow of heat and yet would hardly be visible. We have developed such a material and will be manufacturing it in a totally automated factory in a year or so for less than a dollar per square foot. Eventually it may cost less than conventional opaque insulations. It is a coating, about one thousand atoms thick, that can be put onto any plastic film. Because the coating is so thin, the coated film looks just like the uncoated film but the materials it is made from and their structure are carefully arranged so the coating reflects heat. That is to say, it reflects thermal or infrared radiation, which is just like light except it has a longer wavelength and is thus invisible to the eye.

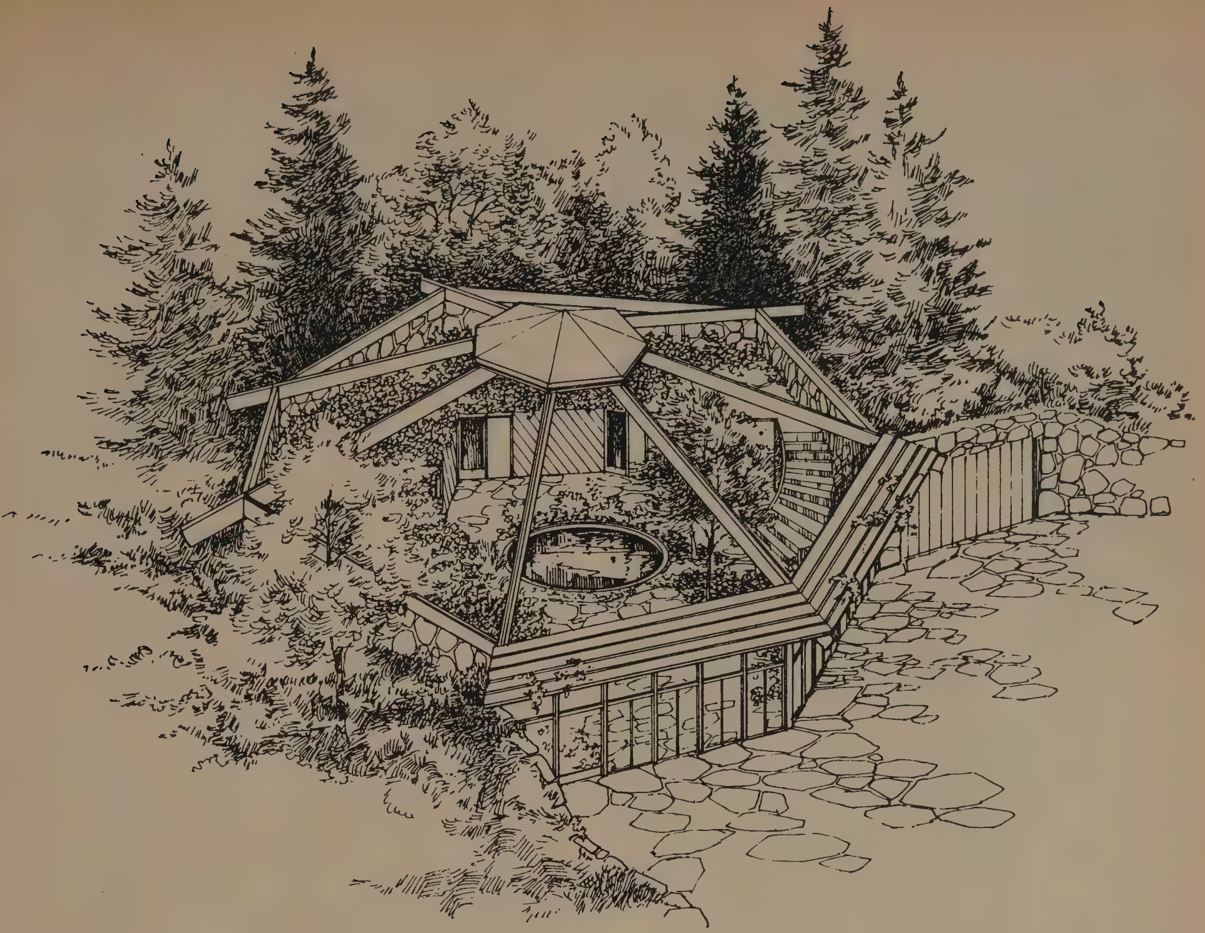
Because infrared radiation is invisible, most people (including many engineers and architects who should know better) don't realize what a large role radiation plays in the movement of heat in everyday life. The recent introduction of infrared cameras is beginning to stimulate awareness of thermal radiation. If you could see it, any energy consuming device such as an oven or an automobile would glow brightly and any cold place, such as an open icebox or the night sky, would appear black.

The coating that we have developed reflects thermal radiation, a property normally possessed only by polished metal surfaces, and this reflectivity makes the coating an effective thermal insulation. Even though the coating is a hundred times thinner than a piece of paper (which is why it is so cheap) it can insulate as well as an inch of plastic foam or glass wool insulation when it is used with a dead air space. This is stepping lightly indeed in the consumption of dollars, energy, and human effort. We call this coating "Heat Mirror."

Cloud Gel

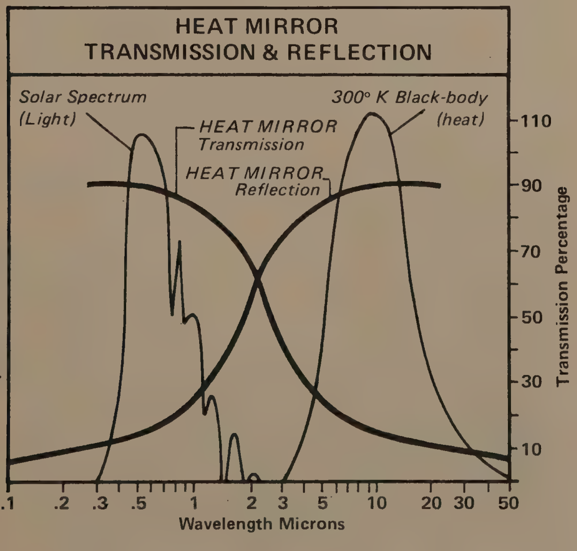
As long as we are imagining things, let's imagine another plastic film, one that is perfectly transparent and indistinguishable from an ordinary plastic film until it is heated above a certain critical temperature, at which point it turns white – an opaque white that reflects light without absorbing it. Imagine also that this temperature induced change is thoroughly reversible; that as soon as the film is cooled below its critical temperature, it becomes transparent again. We have developed such a material – called "Cloud Gel" – and are convinced it would also be inexpensive to manufacture. It switches from transparent to white and back again instantaneously over a temperature change of only three degrees. This transition temperature can be tuned to any value between 0° and 100° C by adjusting the proportions of its constituents.



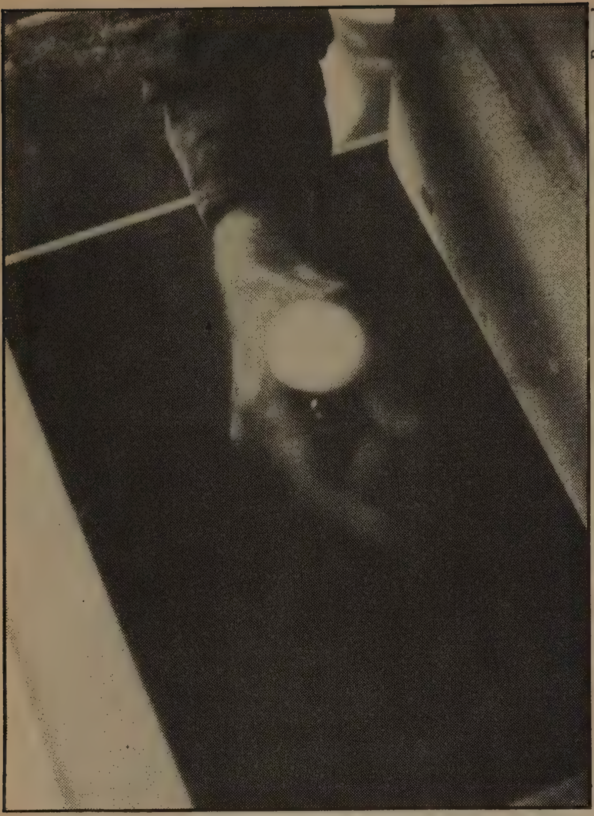


Like a one-celled organism, a house using HEAT MIRROR and CLOUD GEL as roof and THERMOCRETE for internal heat storage will respond homeostatically, maintaining a constant interior comfort by selectively exploiting the exterior fluctuations of temperature and weather. Since the materials are temperature-tuned at the molecular level, almost no mechanical devices are needed.

The Cloud Gel is made from plastic molecules which are like long chains. These chains are dissolved in a solvent where they thrash about in a tangled mass much like spaghetti in a pot of boiling water. Since the diameter of these chains is much smaller than a wavelength of light, the light cannot "see" them anymore than a large fish swimming in a straight line through a sea of spaghetti could distinguish individual strands. Physicists would call this an example of the uncertainty principle. Thus the plastic solution appears perfectly homogeneous and transparent to the eye in spite of its fine structure. The plastic chains are dissolved in the solvent by virtue of their attraction for smaller and roughly spherical solvent molecules which coat them to form a "cage" much like the insulation around a wire. As the solution is heated, the chains thrash about with more and more violence (thank God we can't hear them) until finally a temperature is reached at which the cage is broken and the solvent molecules are cast off. At this point, the plastic molecules become insoluble in the solvent.



Now an interesting thing happens. Without the solvent cage the chains and solvent repel each other and they try to reduce the surface area where they are in contact. The chains accomplish this by curling from their extended position up into balls like spaghetti wound on a fork. Of course the diameter of these balls is much greater than the diameter of the chains. In fact the balls are now large enough to deflect our fish (light particles) from their straight line paths when they bump into them. This change from extended interwoven chains to separate balls is observed on the macroscopic level as a change from transparent to opaque white. The light is scattered randomly from its straight line path and the information contained


Brand

Lighting a cigarette lighter under a pane of glass coated with CLOUD GEL demonstrates the shift from transparent to white-opaque with a rise in temperature. The transition takes place in less than a second.

in the image the light transmits is lost. When the solution is cooled, the whole process is reversed — the balls unfold, reacquire their solvent coating, and the Cloud Gel becomes transparent again. Of course the plastic and solvent molecules are specially designed to have these relationships.

Thermocrete

Now imagine a concrete block, one that can store twenty times the amount of heat that an ordinary block can and furthermore without a change in temperature. How can heat be stored without a change in temperature? Consider a glass of ice water. Since the ice and water co-exist, the temperature must be 0° C — the freezing point of water and melting point of ice. If heat is added to the ice water, the temperature cannot rise until all the ice has melted. Similarly, if heat is removed, the temperature cannot be lowered until all of the water has frozen. A scientists would call this an isothermal situation since large quantities of heat can be exchanged without attendant temperature changes. The temperature of the glass of ice water is self-regulating. Now every material has its own melting point, so if we want to store heat (or "cool" which is really another way of looking at the same thing) at some particular temperature, we merely select a material which melts at that temperature. Since the changes in molecular structure and organization are much greater in the solid-liquid transition than they are in simply heating and cooling a material, the quantities of heat involved are similarly greater. Unfortunately most materials when cooled a bit below their freezing point do not crystallize but remain liquid unless there is a "seed" crystal for them to crystallize around. That is to say, it is easy to make a crystal grow, but hard to create one from a pure liquid by just cooling it. Another problem is that most materials, unlike water, are made from several components which on freezing can form a variety of different solids, each with different proportions of the components. These other solids generally store much less heat and store it at the wrong temperature. A third problem is that like the ice water, which needs a glass, these materials also need a container to prevent things from getting messy. All of these problems can be solved by incorporating the heat storage material into the very fine pores in foamed concrete. The concrete initiates crystal growth by acting as a seed, it keeps solid and liquid components from separating by the fineness of its pore structure which insures that the sought after compound is formed on freezing, and the concrete acts as a structural container for the thermal storage material when it is in its liquid state.

We call this material which we are developing "Thermocrete." For a room temperature melting point its main ingredient is calcium chloride, the stuff they throw on streets to melt ice. We can select other salts to store heat at many temperatures between 0° C and 100° C. Laboratory samples have withstood one thousand freeze-thaw cycles with no measurable loss in the amount of heat stored. The compressive strength of Thermocrete is one thousand pounds per square inch, approaching ordinary concrete.

Combined

So now we have three new materials — a material which transmits light but not heat, a material which transmits light when it is cool and reflects it when it is hot, and a material which stores heat and cool without getting warmer or cooler. So what?

Well, suppose one were to lay a stack of these materials out in an open field as is shown in the first drawing, what would happen? Assuming it is a sunny day, sunshine will pass through the Heat Mirror and Cloud Gel and will be absorbed on the Thermocrete where it will turn into heat. Since the heat cannot escape through the Heat Mirror, it will go into the Thermocrete where it will melt the heat storage material in the Thermocrete. We have thus trapped and stored the sunlight.

When all the heat storage material has melted, and only then, the temperature of the Thermocrete block will start to rise. If we have set the temperature at which the Cloud Gel turns from transparent to white a few degrees above the temperature at which the Thermocrete melts, then only after the Thermocrete is completely charged with heat will the Cloud Gel turn white. Thus the Cloud Gel prevents the sunlight from overheating the Thermocrete. The Cloud Gel does not respond to outside temperature changes because it is insulated from them by the Heat Mirror. Nor does it respond to sunlight, being activated solely by temperature. So, during a sunny day, this stack of materials rises to a temperature in the narrow range

(70° F to 75° F) between the transition temperature of the Thermocrete and the transition temperature of the Cloud Gel, and stays there.

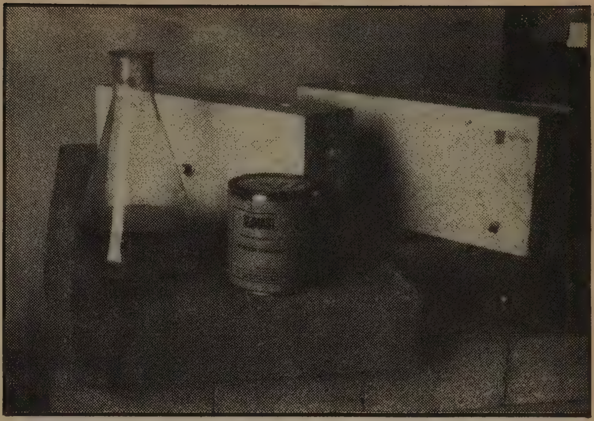
What happens at night or during a cloudy day? Heat slowly leaks out of the Thermocrete through the Heat Mirror, and the Thermocrete slowly freezes without cooling. Calculations show that if the Thermocrete melts at 70° F and the temperature averages 30° F outside, and we are using two layers of Heat Mirror, then over a 24-hour period a layer of Thermocrete only one third of an inch thick will freeze. This is a measure of how good an insulation the Heat Mirror is and how good a storage material Thermocrete is. Calculations also show that on an average January day in Boston there will be enough sunlight falling through our stack of materials to melt two thirds of an inch of the Thermocrete. Thus we see that even in the grip of the Terrible New England Winter, our stack of materials easily maintains a comfortable 70° F day and night by captured and regulated sunlight.

Thermocrete is also useful for cooling in the summer, especially in hot dry climates where the nights are usually below 70° F even when daytime temperatures reach 100° F. This is done as follows. During the night the Thermocrete is cooled by placing it in contact with the cool night air by using either natural convection or fans. If you'll remember our glass of ice water, you'll see that the Thermocrete can store large quantities of "cool" just as it can store heat, and it stores this cool without a temperature change. This is the beauty of storing heat and cool by melting and freezing. Since the Heat Mirror and Cloud Gel isolate the Thermocrete from the heat and sunlight of the day, the cool collected and stored during the night trickles out very slowly during the day. This "ratchet effect" is useful most of the time even in hot humid climates, but it won't work all the time in the deep south where the summer nights are usually above 70° F. When this happens the Thermocrete can't freeze.

In summary, these three materials can maintain a comfortable year round climate by utilizing locally available and natural (free) energy sources — sunshine and cool night air. This remarkable winter and summer performance has been borne out by experiments and computer simulations. It is done with no moving parts except molecules, electrons, and photons, which don't wear out, and with materials which are extremely cheap. The simplicity and elegance resulting from the design of building materials on a molecular level is reflected in their cost effectiveness. Other climate control systems requiring energy inputs and active elements will find it difficult to compete with the combination of these materials in the market place.

Organism

Now we can see where the title of this article came from and what the viewpoint is that unifies these three materials. It is the biological analogy which gave the direction for their development. The building is viewed as a one-celled organism whose environment contains all the necessary nutrients and also some hostile elements. The cell wall (Heat Mirror and Cloud Gel) establishes relations between the inner and outer environments in a way such that the internal environment remains constant while the external environment changes. Using the selective permeability of its roof or walls the building exhibits homeostasis, perhaps the most basic property of living things.



Brand

Blocks of THERMOCRETE are made from ordinary concrete blocks by sealing a calcium chloride phase-change-material tuned to 75° F (in flask) into the block with epoxy or other sealant (can). THERMOCRETE has a latent heat of fusion of 25 BTU/pound — 1/6 as great as ice.

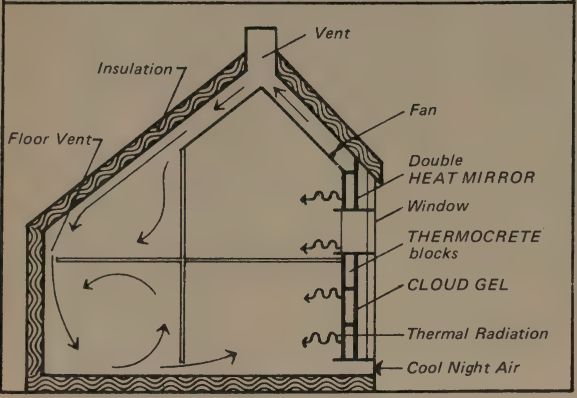
Well, this discussion has all been very abstract, but how will these materials actually affect buildings? In two sorts of ways. First, they will allow conventional buildings to use local and renewable rather than centralized one shot energy sources and thus greatly reduce the cost of running conventional buildings. The sun belongs to everyone — coal, oil and uranium don't. Secondly, these materials will make it possible to build new types of buildings.

In order for these materials to have an interesting effect on the real world, they must first find large and perhaps unimaginative existing markets to initiate the manufacture and distribution of the new materials. Both manufacture and distribution are subject to the economies of scale, so our materials will not be cheap until they are popular. Since new buildings replace old buildings about every 40 years, there is a large market in reducing the energy consumed in the heating and cooling of existing buildings.

Although it has been compared with putting sails on tugboats, the use of Heat Mirror on all existing windows would reduce national energy consumption by about 1.2 million barrels of oil per day and save Captain and Mrs. America almost a dollar per year for each square foot of window they cover with Heat Mirror. The use of Cloud Gel on all windows where sunlight increases air conditioning loads would reduce national energy consumption by roughly .5 million barrels of oil per day.

Thermocrete could also reduce the amount of fuel used in heating a building by storing the heat from its oil burner and then distributing the heat to the building when needed. Since the oil burner need fire only

PASSIVE HEATING AND COOLING WALL



once per day, it would not waste fuel getting up to operating temperature. A four foot cube in the basement next to the oil burner would be large enough for the average home and would pay for itself in two or three years. Universally installed, these units would save the U.S. about 1.3 million barrels of oil per day. On the other hand, much smaller Thermocrete cool storage units connected to air conditioners would allow electric power plants to run at night. While this would not save fuel, it would save money since electric generating stations would not have to be so large, as they are usually sized for air conditioning peak loads. Adding the effects of all these retrofit energy conservation measures together, these three materials could reduce national energy consumption by about 10% and reduce the need for adding nuclear capacity as fossil fuels run out.

In Use

For new construction or for retrofitting of fairly conventional looking houses with solar heating and night air cooling, we need to turn our stack of materials on end to make the south wall of the house. The second drawing shows such a house. This wall does many things. It is a load bearing structural element, it collects solar heat and night air cool, it stores this heat and cool, and it regulates and distributes the flow of heat and cool. Since in new construction it replaces an ordinary south wall, its energy processing functions are purchased for a marginal increase in cost. Structures using these materials which are thermal models of this type of building are being tested at M.I.T. and Los Alamos Labs. Their test performance will be put into computers to predict performance in other climates. Our materials should also find wide application in improving the performance and lowering the cost of conventional solar heaters.

Climatic Envelope

But much more interesting than energy conservation and solar heating is the entirely new kind of buildings that can be built using these materials. These include Climatic Envelopes and Biospheres. The Biosphere is a home which feeds, heats, and recycles water and the wastes of its occupants. Its potential social impact is enormous because it makes work, in the sense of the nine-to-five job, unnecessary. Its core is a solar collecting greenhouse which can be built without our three materials, but which would benefit greatly by them. Also based on the biological analogy, the Biosphere was invented by the author in 1969. Since then the New Alchemists, the Berkeley Solar Group, and the Ouroboros Group have actually built functioning whole systems.

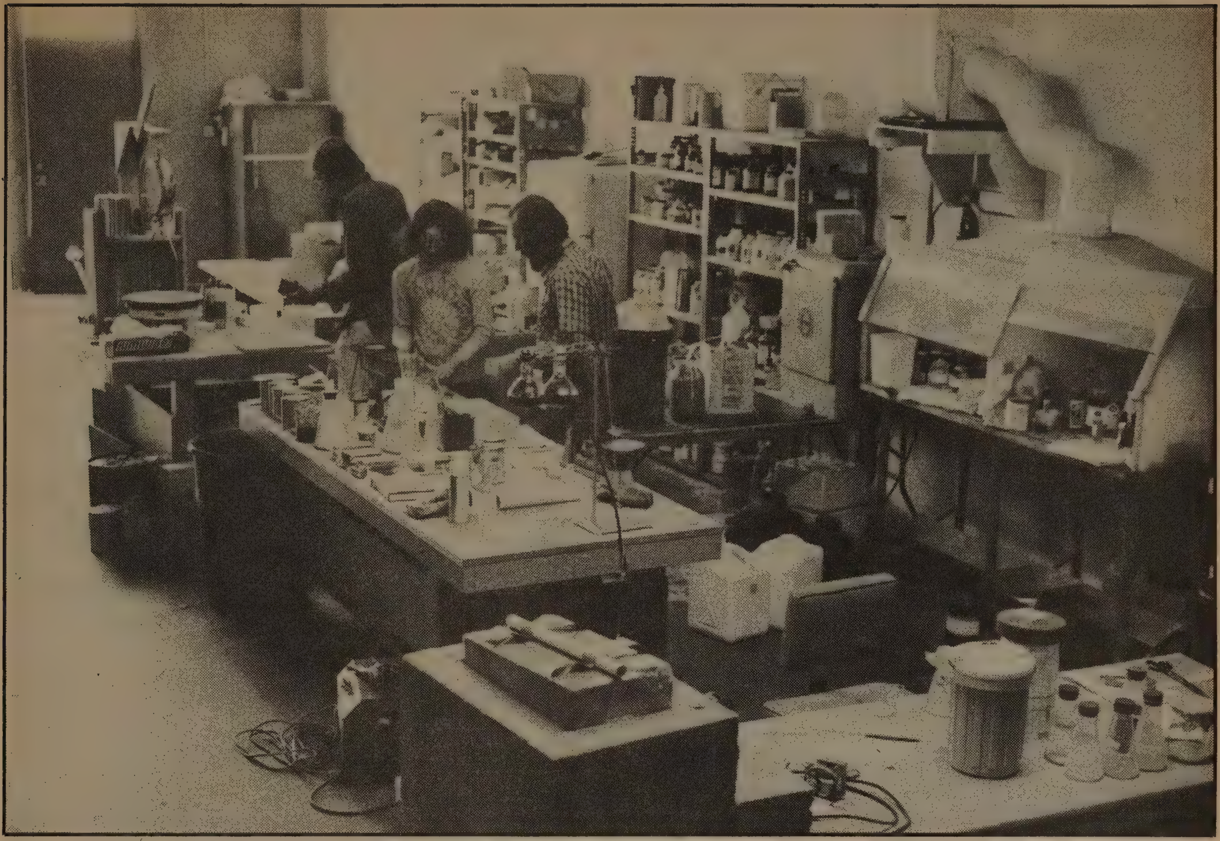
The Climatic Envelope is an old concept, but no one has built one yet because it won't work without the three materials. It is simply the stack of materials from the first drawing elaborated into a large bubble of good weather. It is suitable in small spans for a revised version of the home or greenhouse. In large spans it can enclose tropical parks or housing developments with no heating or cooling bills. First use will probably be for covering large commercial buildings such as sports arenas, shopping centers, university campuses, etc., but they also seem to be the most practical solution to the problems of energy for space conditioning the city, where any other kind of retrofitting seems hopeless. The height of large span envelopes will facilitate natural ventilation by wind and the chimney effect, but one could not use present automobiles inside climatic envelopes.

Removing the weather protection and structural restraints from the living areas inside buildings should produce a corresponding relaxation and personalization of the internal architecture, not to mention a great reduction of first and running costs. The main functions of a home under a climatic envelope are visual and audio privacy and pleasing appearance. These greatly reduced functions are much more within the realm of the amateur home builder in both skill and financial resources. Because the shelters inside the climatic envelope have such reduced functions, they can consist largely of movable partitions and sound proof curtains. Activities that now occur inside only for climatic reasons could take place in the "open air." The envelopes could be either one for each family, separated by berms, or could span large areas, with families separated by trees and fences.

The last two drawings show a typical Climatic Envelope. The building is a transparent roof, shaped to shed snow, placed over a hole dug in the ground. The rooms are placed against the walls of the hole in the form of a horseshoe which is covered with gardens. Fruit trees and vine arbors provide shade. The outer roof is made from Heat Mirror and Cloud Gel and the leaves of the plants are the absorbing surfaces for sunlight. Thermal radiation and a big lazy fan circulate either heat from the plants (or cool night air when appropriate) to Thermocrete tiles which are distributed throughout the structure.

Suntek

So that, in broad strokes, is what Suntek is all about. Who is Suntek and how did we get together to develop these interests? Back in 1968 while traveling through New Mexico I met Steve Baer, who has a particular design esthetic about buildings and had organized a



Brand

Suntek's lab area for development of THERMOCRETE and glazing materials for solar collectors.

company, Zomeworks, to realize this esthetic — which is based on minimal use of materials, energy, and human effort and is directed towards the needs of people in the third world. Solar energy seemed like a safe field for a physicist and the philosophy was appealing, so we worked together for several years with some funding from the Whole Earth Catalog.

In 1973, Blair Hamilton invited me to a conference he had organized that was held in a half acre transparent inflatable bubble that he had built for Antioch College with Charles Tilford, Sean Wellesley-Miller and Beth Sachs. This building was built with materials like the ones I was working on in my mind and was a product of the same design esthetic, so we were naturally quite excited about meeting each other. Sean invited me to work with him at M.I.T., where he was in the Architecture Department faculty. We were able to get a National Science Foundation grant which was 17% of the nation's then miniscule solar energy budget. At this point, John Brookes, a biochemist from Harvard who had also been working on heat mirrors, joined Sean and me.

In 1975 the oil crisis shifted the government's funding emphasis in solar energy from the academic to the private sector, and Suntek was awarded two materials development contracts from the Energy Research and Development Administration, one for Thermocrete through Oak Ridge National Laboratory and one for Heat Mirror and Cloud Gel through Lawrence Berkeley Laboratory. Since these materials had already been invented and patented by Suntek, we were able to retain manufacturing rights. At this time John, Sean, and I moved to our present location in California where we were joined by Charles Tilford, a mechanical engineer, and Blair Hamilton and Beth Sachs, both very competent scientific administrators. After spending a year setting us up and organizing us, Blair and Beth left to help the National Center for Appropriate Technology get organized. Mel Hodge, our president, has filled their role. His considerable talent and business experience should prove instrumental in bringing our materials into the real world.

A venture like Suntek would not exist today were it not for the encouragement, advice and financial support of a varied group of people whose common denominator is imagination, a vision of a certain kind of future, and confidence in their own judgement. We anticipate that Suntek will remain a research organization committed to translating the philosophy expressed in this article into reality. We expect to work with other companies — either existing or established for the purpose — in transferring this new technology from our research laboratory into production and the marketplace. At this point, none of the materials described in this article are yet available for sale except for Heat Mirror in limited quantities 12 inches in width at rather exorbitant prices because it is being manufactured on a prototype machine. We would like to build a climatic envelope like the one illustrated. Again, costs would be relatively high because the structure and materials are experimental. ■

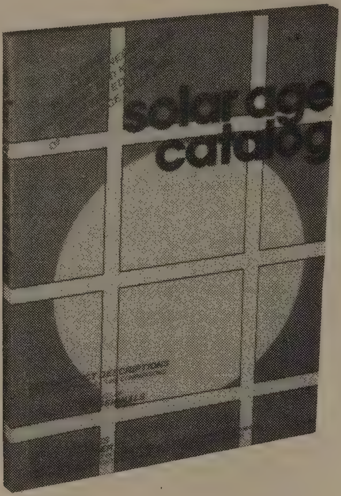
Box 428, Sausalito, California 94965

Solar Age Catalog

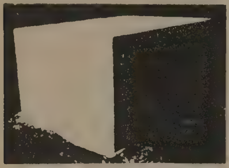
A flourish of trumpets please! Here is the first real quality catalog of solar hardware and materials. But that's not all. The catalog features extensive articles by known solar energy experts so you'll be better able to judge the equipment shown. That's a pretty bold move, as catalogs go, and typical of the sponsoring Solar Age *magazine. By the way,* Solar Age *is now the official magazine of the American Section of the International Solar Energy Society.* Solar Age *($20/year from Church Hill, Harrisville, NH 03450) also promises to update the catalog in a regular monthly column. This may well be the best catalog of anything I've ever seen.*

—J. Baldwin

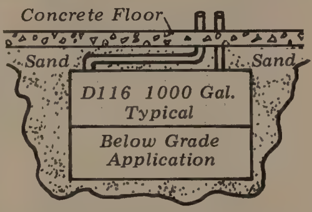
Solar Age Catalog
1977; 232 pp.
$8.50 postpaid
from:
Solar Age
Church Hill
Harrisville, NH 03450
or Whole Earth



THERMAL STORAGE VAULTS
manufactured by.
American Solarize Inc
19 Vandeventer Ave
Princeton, N.J 08540
Joe Beudis: phone: (609) 924-5645



Vaults are made of lightweight cellular aggregates, vermiculite cement, and other additives. Can be used for rock storage or liquid tubes or be filled directly with liquid. Needs no other insulation. **Features and options:** standard sizes or custom made. **Installation requirements/considerations:** suitable for above or below ground applications. **Guarantee/warranty:** on manufacturing defects and failure to meet warranty specifications. **Manufacturer's technical services:** design service available, field supervision when necessary. **Availability:** f.o.b. from factory **Price:** $250 to $6,000



New Alchemy ARK

Now there's another ARK, this one on Cape Cod, Massachusetts. You can get a spiffy full color poster of it with a brief explanation of how it works on the other side. For more details, you should check the latest Journal of the New Alchemists. *Always excellent and a cause for joy, this one is about twice as thick as earlier ones. The New Alchemists continue to set a beautiful example in their imaginative, scientifically rigorous work. —J. Baldwin*

ARK poster
$3.00 postpaid

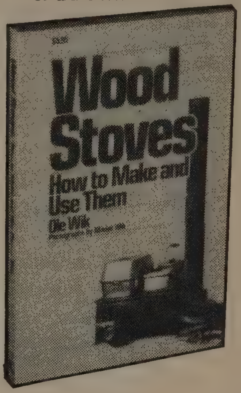
Journal of the New Alchemists No. 4
$7.00 postpaid
from:
New Alchemy Institute
P.O. Box 432
Woods Hole
MA 02543

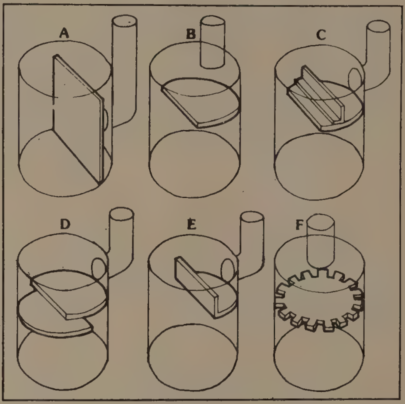
Wood Stoves

Yes, you can make a stove if you're reasonably adept with tools. You'll likely save quite a bit of money too, considering the inflated price of the better grade of commercial jobs. Stovemaking might also be a good way for woodbutchers to get into metalworking, as the proper attitude will be familiar even if the materials are not. Very fine diagrams and photographs back a chatty, experienced text in this comprehensive manual. Many proven designs are shown, including cookstoves. The author is a warm Alaskan.

—J. Baldwin

Wood Stoves
(How to Make and Use Them)
Ole Wik
1977; 194 pp.
$5.95 postpaid
from:
Alaska Northwest
Publishing Co.
Box 4-EEE
Anchorage, AK 99509
or Whole Earth





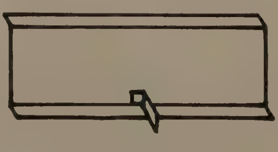
Various baffle arrangements for vertical drum stoves.

Sili Shutters

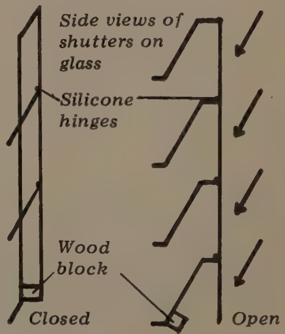
Marc Sherson of Zomeworks has performed some simple tests on thin aluminum shutters attached to a window by means of a thin hinge of silicone seal. Tests show that the shutters are more efficient than double glazing, especially if you consider that they are much better in keeping out unwanted heat gain too. This idea is part of an increasing tendency to regard walls less as fortress and more as controllable membrane like our skin.

—J. Baldwin

Sili Shutters
write for information from:
Zomeworks Corporation
P.O. Box 712
Albuquerque, NM 87103



Shutter with Tab



Does Intercourse Cause Cancer?

by Josephine Hill, M.P.H.

Each year in this country about 50,000 women develop cervical cancer. The curious thing is that virgins, lesbians and nuns rarely develop it. In addition, some studies show that women's risk of getting cervical cancer increases with the frequency with which they have intercourse.

It is now known that 90% of cancers are caused by environmental carcinogens or life style factors. But no one factor is the cause of any cancer. Many influences must be present and coordinated to produce cancer. Some are regarded as "initiators," some are merely "promotors" and there is "genetic predisposition," too.

So intercourse cannot be the only contributing cause of cervical cancer. The taking of estrogen drugs by women is certainly a mediating influence. So is her genetic constitution (family history) of cervical cancer. And now studies are correlating "repressed personality type" and "emotional stress' with cervical cancer.

Nevertheless, **CQ** readers might like to know the latest theories on how sexual intercourse may cause or promote cervical cancer:

The first theory is the least likely. It says that uncircumcised males transmit a bacteria from the smegma that collects under an improperly cleaned foreskin, and this causes cervical cancer. This generalization is based on the observation that Jewish women as a group seem to have a lower incidence of cervical cancer, and everybody knows that Jewish men are circumcised. But so are most adult men in the U.S., and that hasn't stopped cervical cancer from being epidemic among U.S. women.

The second theory is not scientifically well-grounded either. It says that cervical cancer is caused by the herpes virus, which is housed in the male genito-urinary tract and transmitted somehow during intercourse. Of course, not all men carry herpes virus. But obviously, the more "promiscuous" a woman is, the greater chance she has of making contact with a man who does.

Backing up the theory that the herpes virus has something to do with cervical cancer are some studies which show that women who carry the herpes virus (as manifested by canker sores in the mouth or on the genitals) have a higher incidence of cervical cancer than women who don't get herpes sores.

The third theory is most likely. It says that all sperm contains an enzyme whose job it is to pierce through the cell wall of the egg so it can get inside the egg (conception) and start growth and pregnancy. So all sperm contains an enzyme that can eat away at cell wall tissue. The trouble is, the sperm can't distinguish between cells that are eggs and the cells of the cervix. Even then it's probably only during certain phases of a woman's hormonal cycle that her cervical cells are vulnerable to this. This is when a new population of cells are regenerating and the new cell walls are thin. The sperm enzyme can more easily get inside those cells and cause some to start dividing, resulting in abnormal cell growth, and if all other necessary influences are present — possibly future cancer.

So what are the times when the woman's cervical cells are vulnerable? Nobody knows for sure. We do know that regeneration of new populations of cervical cells is a response to hormonal fluctuation. So we can assume that vulnerable times are at puberty, and also a few weeks following the birth of a child. It is interesting that most human groups, both "primitive" cultures and in modern civilization, have had taboos against intercourse at these times.

Now, the question in my mind is, do a woman's cervical cells go through this regeneration in response to hormonal fluctuation every month during her monthly cycle, too? And if so, on what days? Certainly not during ovulation — that's a time when it had to be safe to have intercourse if the human species was to reproduce itself.

Now cheer up. Remember that using a diaphragm or a condom would protect the cervix. Granted, diaphragm spermicides are probably harmful to the woman if they are absorbed through her body into the bloodstream. And most men don't like wearing condoms because they decrease sensitivity. They should encourage the U.S. Food and Drug Association to allow condom manufacturers to produce condoms like the ones sold in Japan. They are one-third the thickness, and just as effective.

If you aren't too depressed already, I'll go on. Did you know that the National Institutes of Health is now also looking into intercourse as a cause of prostatic cancer in men? The theory is — once again — either viral transmission from the woman — or — that having sex internally generates hormones that affect the target organs — both the prostate and the cervix? ■

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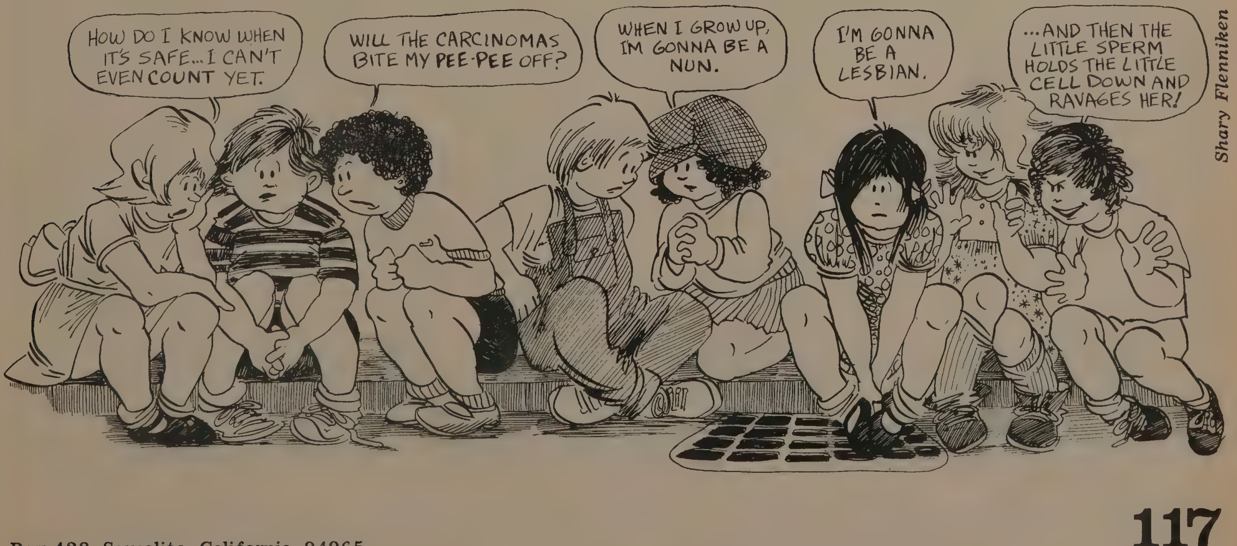
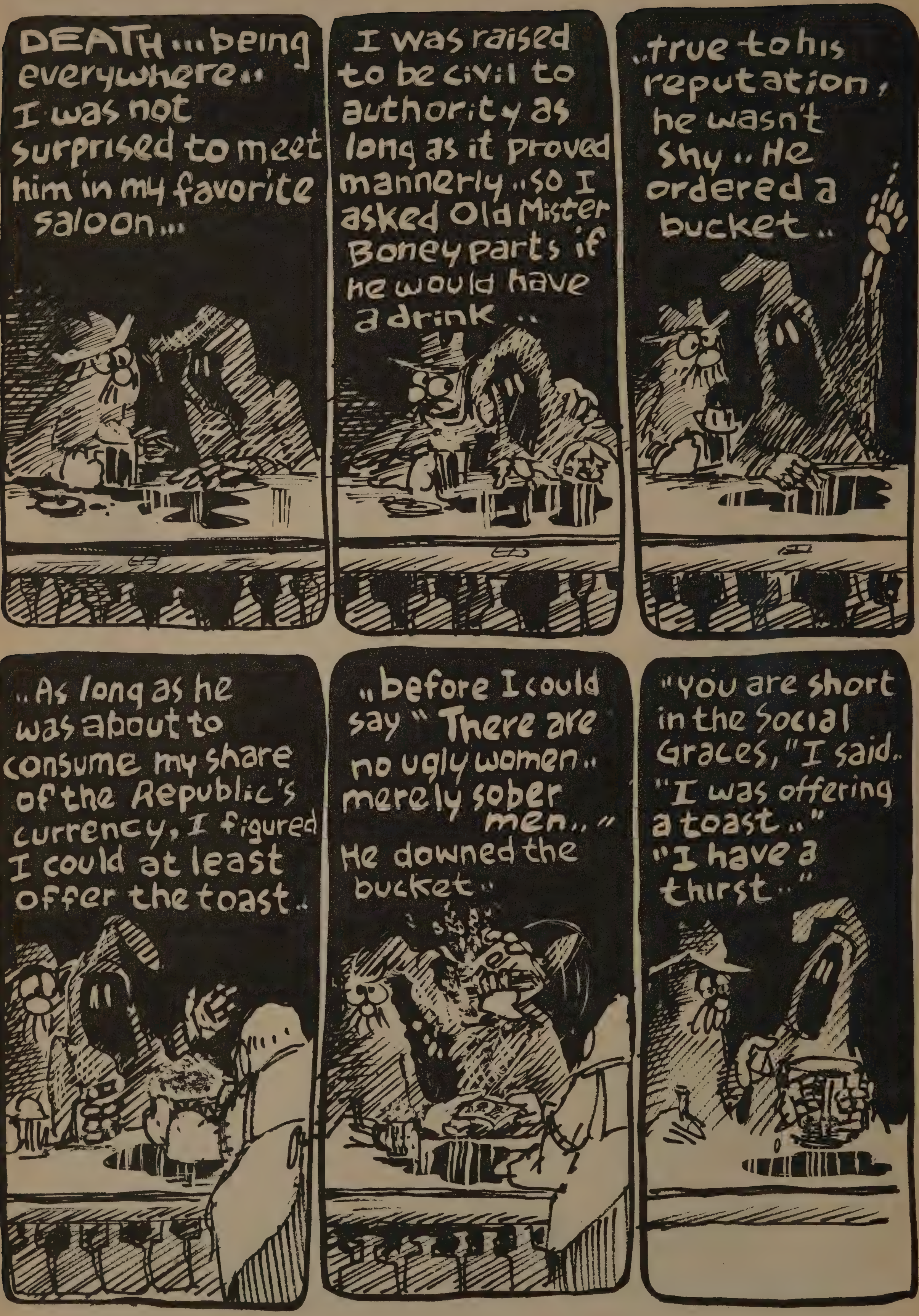
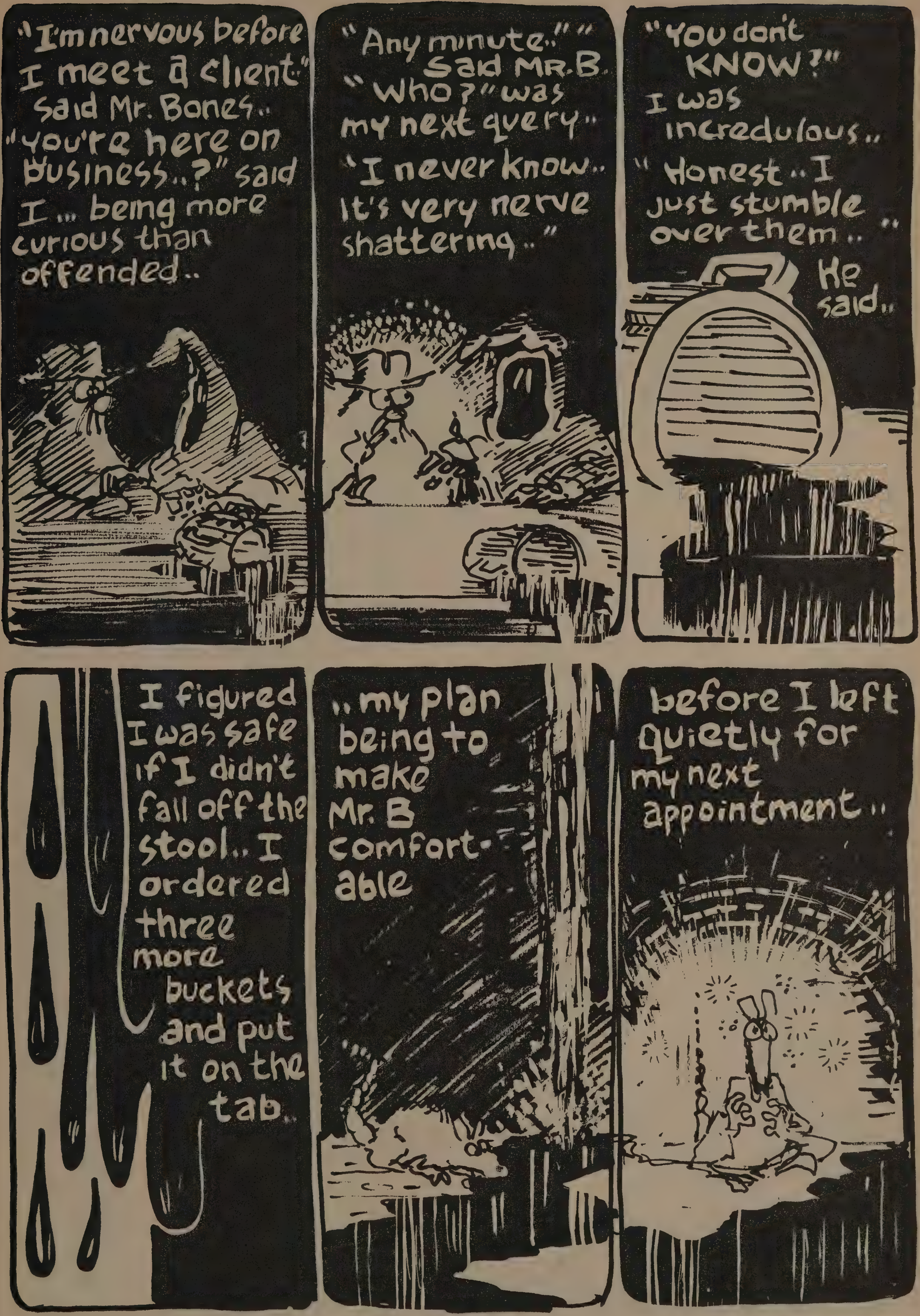
Coppleson, M. Carcinoma of the Cervix: *Epidemiology & Aetiology.* British J. Hospital Med. 2(5), p. 961-980, 1969.

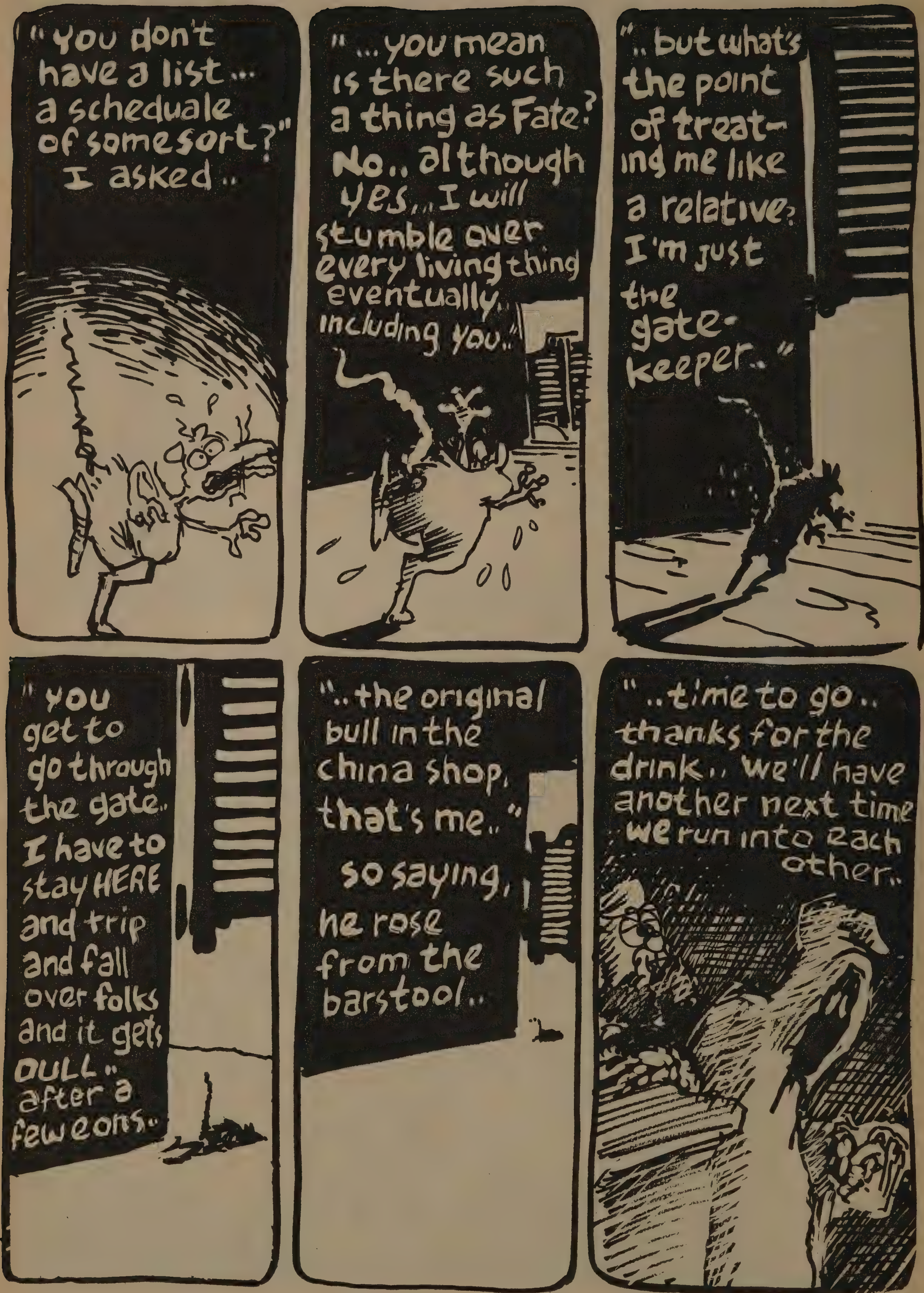

HOW DO I KNOW WHEN IT'S SAFE...I CAN'T EVEN COUNT YET.
WILL THE CARCINOMAS BITE MY PEE-PEE OFF?
WHEN I GROW UP, I'M GONNA BE A NUN.
I'M GONNA BE A LESBIAN.
...AND THEN THE LITTLE SPERM HOLDS THE LITTLE CELL DOWN AND RAVAGES HER!

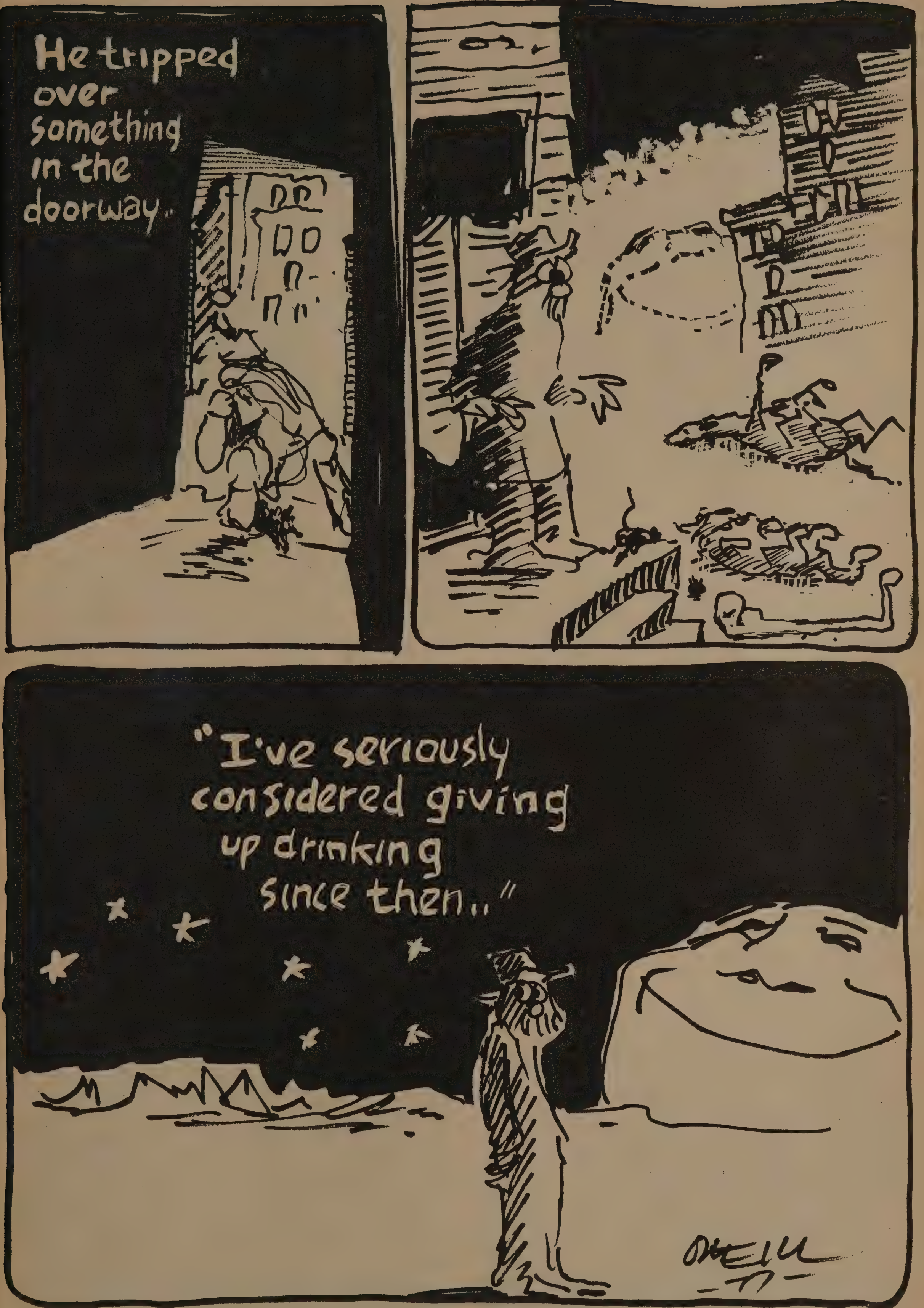
Shary Flenniken

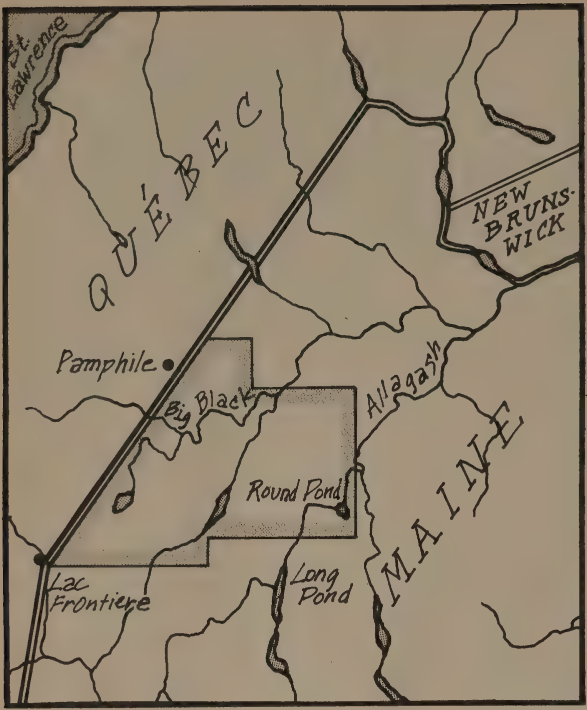
Mr. Boney Parts *by Dan O'Neill*


DEATH... being everywhere.. I was not surprised to meet him in my favorite saloon...
I was raised to be civil to authority as long as it proved mannerly..so I asked Old Mister Boney Parts if he would have a drink..
..true to his reputation, he wasn't shy.. He ordered a bucket..
..As long as he was about to consume my share of the Republic's currency, I figured I could at least offer the toast..
..before I could say "There are no ugly women.. merely sober men.." He downed the bucket..
"You are short in the Social Graces," I said.. "I was offering a toast.." "I have a thirst.."


"I'm nervous before I meet a client" said Mr. Bones.. "you're here on business..?" said I... being more curious than offended..
"Any minute.." "said MR. B. "Who?" was my next query" "I never know.. It's very nerve shattering.."
"You don't KNOW?" I was incredulous.. "Honest.. I just stumble over them.." He said..
I figured I was safe if I didn't fall off the stool.. I ordered three more buckets and put it on the tab.
.. my plan being to make Mr. B comfort-able
before I left quietly for my next appointment..


"You don't have a list... a scheduale of some sort?" I asked..
"...you mean is there such a thing as Fate? No.. although yes... I will stumble over every living thing eventually, including you.."
"..but what's the point of treating me like a relative? I'm just the gate-keeper.."
"you get to go through the gate.. I have to stay HERE and trip and fall over folks and it gets DULL.. after a few eons.."
"..the original bull in the china shop, that's me.."
so saying, he rose from the barstool..
"..time to go.. thanks for the drink.. we'll have another next time we run into each other.."


He tripped over something in the doorway.
"I've seriously considered giving up drinking since then.."
ONEILL
-77



"You're hunting the hunter.
It's better sport than he's enjoying."

A New Wolf

RODNEY SIROIS

TALKING TO LYNN FRANKLIN
AND RON POITRAS

> *Nine deer dead at Sibley Brook, 17 in one hard hunted woods in Waldo County, four off Route 16 near Oquossoc, seven in Franklin, a dozen off snowmobile trails in as many localities, five at Abbot and so goes the reports. . . Coyotes have to eat and what they don't eat they drive out of the country. . .*
>
> Gene Letourneau, "Coyote Comments", in "Sportsmen Say", *Kennebec Journal,* Augusta, Maine, May 23, 1977.

I left Caribou, Maine, my home town, at 17 and took 57 weeks of schooling in the Navy in underwater demolition and parachuting. We were jumping from airplanes from four miles up and free falling for three miles. Then we would jump into the water with scuba equipment. We started with 144 guys and graduated 32. We ran 20 miles routinely and swam 7 miles in the open sea. I learned that as long as you made up your mind to do something like that, you probably could do it. I learned what I could do if I wouldn't quit and maybe that's what matters.

That training was really mental training. The weight lifters dropped out, for example. The determined men made it. If you are in good physical shape, as long as the mind says YES the body will respond and it's amazing what it will do. And the smaller, more wiry guys had the advantage. We swam out from submarines on the bottom and set demolition charges. The work required self confidence and endurance. My buddy drowned at 180 feet of water in a sneak attack against a cruiser. We were breathing pure oxygen and he got oxygen poisoning. At that depth the life jacket cannot inflate properly and I remember telling myself to kick up, keep on kicking up, I don't want to die down here. They never found his body. That was a bad experience. We did this a lot, day and night, it was part of our program. We lost four guys out of our platoon and all in peace time. The work was just like a James Bond thriller, just as daring and extravagant. I almost stayed in to go to Vietnam with the rest, but I decided I wanted to go to college.

I went to Suffolk Community College on Long Island, New York, and I managed to get an Associate's degree. I met my wife Judy there. I got a private pilot's license and then a commercial license and instrument rating. And I realized that place I left in northern Maine wasn't such a bad place after all. I had been four years on Long Island.

So I sent a letter of inquiry to the Commissioner of the Department of Inland Fisheries and Game about being a flying warden. The Commissioner wrote back and said, "Well, young man, the first thing you ought to do is become a game warden." Judy was well qualified for this life. She swam competition and likes outdoors. And she has no illusions about city life. So we passed the examination and were selected and I came here. Most wardens are ready to leave

Ron Poitras, 34, was a high school classmate of Sirois (rhymes with "deerway") in northern Maine. At present he works part-time at Northeast Carry, a small-farm and alternative energy organization he founded in Hollowell, Maine. Lynn Franklin, 38, is a photo-journalist for the **Maine Sunday Telegram** *and has recently finished a book,* **Profiles of Maine** *(from Maine Antique Digest, Waldoboro, Maine). This article is a portion of their forthcoming book on northern Maine and the Allagash, which is still shopping among publishers.*

—SB

Lynn Franklin

Rodney Sirois, game warden on the Maine-Quebec international boundary.

after two years. It's no problem getting a guy to transfer out. But I like it and I don't think I ever want to leave.

My district runs south on the boundary from St. Pamphile, Quebec, to Lac Frontier and east on the Lac Frontier road to Nine Mile Ridge, downriver from Nine Mile to the mouth of the Big Black where it runs out to the Allagash and Round Pond. I patrol up to Long Pond Dam on the Allagash. My primary job is the enforcement of the fish and game regulations. Prevention is another important reponsibility.

> *The Northeastern coyote has become a menace in. . . Maine. The purpose of this bill is to establish a $50.00 bounty for the killing of a coyote. . . No bounty shall be paid unless the claimant, within 10 days after he has killed such animal, exhibits to the warden in whose district the animal was killed the entire skin, thereof, with the ears, nose, and tail thereon in as perfect a state as when killed. . .*
>
> – *An Act to Establish a Bounty on Northeastern Coyote,* L.D.N. 7666, presented by Mr. Immonen of West Paris, House of Representatives, March 8, 1977, Augusta, Maine.

I love to work the Allagash. On a frosty morning you cut across a print and you know there's a Canadian in there hunting moose and get on his track. It's exciting because you're hunting the hunter. It's better sport than he's enjoying. I like to surprise him, get as close to him as I can before I jump him. He's going to run, always, because once he crosses the U.S.-Canadian boundary he's homefree. It's a hell of a game.

Oftentimes in the woods you have to set for hours and hours waiting for a man you are tracking. Oftentimes he will circle around and come back to the trail just to orient himself, and if he's experienced he will not come out of the woods along the trail. The people are good poachers. They've lived off the land for 200 years and they are going to continue doing so. You can get their respect if you do your job properly.

The Canadians have a moose season and they line the boundary. In effect it's the same as having a moose season in Maine. The hunters live within 45 minutes drive and we have the best moose population by far. The Canadians know that and they hunt inside the boundary and up and down it; they kill moose in Maine or call them into Canada and kill them. I have forty miles of boundary that's all foot work. Just leave the truck in the yard. The moose hunting season in Canada is the breeding season also, late September, and moose will come to the call. They'll come to the call, shackles up on their neck. Tracking conditions are just starting to get good then. I have gotten in 80 miles on foot a week. Times have changed so much you don't walk much any more, but we're still working the boundary up here just like the wardens 50 years ago.

I remember once I jumped three guys and they started running. I tackled one guy – and once you make contact there's no fight – put the handcuffs on him and to a tree. Then I took off after the next guy who was running towards the line with everything he had. I take pride in keeping up something of my service fitness and I run a couple of times a week should I be spending too much time driving. I can hold a good hard jog for a few miles. If I get within sight of a guy two or three miles in, 99% of the time I've got him. If he wants to run, I'll let him run, especially if he's larger than I am. I let him run himself tired. Then when he's out of wind I'll tackle him. I've never had a seriously hard time.

When my partner Jim first came on, it was a Sunday. I said, I know a place we'll check. We went in about three miles and there were the footprints in the snow.

[more→]

Lynn Franklin

The Allagash River

The poachers had a Volkswagen with tractor webbing on the wheels. I said to Jim to wait at the car and I was going to make a circle and cross their tracks. I heard Jim holler, and he speaks French well. He met a Canadian coming out of the woods. Naturally the Canadian had a rifle and no license. So he was hunting without a license on Sunday. He was hunting moose too, but you can't actually prove that unless he's got a moose call or a moose. The poacher said he was alone. I said to Jim, he's not alone, there's another guy here. I told Jim to cuff the poacher to the vehicle and I would make another circle and pick up the other man's trail.

I had just about made the circle when I heard a terrific hollering on the boundary. I ran back hard and by then it was snowing like the devil and the poacher was carrying his gun cradled in his arms runnin' as hard as he could to the boundary. Just past it, 25 yards or so, was his car. He threw his rifle across the boundary and charged into Jim. He was an older guy, not very big, but determined and pretty strong. Jim had him pinned in the snow and smacked him in the mouth. I ran over and got into the mess with them rolling around in the snow and I was trying to get his arms out behind him. He was on his hands and knees, digging his fingers into the snow and dragging both of us toward the boundary. Jesus, he was tough. I was trying to get his legs and arms cuffed together and that man dragged both of us across the line into Canada. He made it too and lay there in the mud crying out, "In Canada, in Canada!" We finally got his legs and dragged him back, and I said to him, "You son of a bitch, you're in Maine now!"

They paid $50.00 for hunting on Sunday and $75.00 for hunting without a license. One of them I had caught before and he says to me, come to my house and I'll get my wife to give you the money. His wife is a great stout woman and I didn't want to meet her again. She was stronger than I was by several times and had given me a hard time once before, so we kept one guy cuffed in the truck and drove up to the house. One of them went in and got the money and came back out with it.

If you're more than 50 miles from court you can take a cash bond. You arrest the guy and bail him on the spot. It's not fine money, it's bail money, but there's never been a court appearance. So we set the bail at what the judge would take for a fine. It's a negotiable item. You might have two guys handcuffed to a tree and two more who made it over the boundary and you're bargaining their fine. You say the fine is $100 and maybe they're only going to pay $80. Your bargaining power depends on what your situation is. If you've got one guy handcuffed and there's one of you and four of them, you can't bargain very well. You can bluff and you try that.

There are a lot of poachers for whom I have a lot of respect, for their skills in the woods and their ability to get around. I have tracked them loaded with meat, no trails, around brooks, across hard slants. I had to admire their ability to get in, find the yard, make their kill, pack the meat out, 400 or 500 pounds maybe. There is a whole lot of skill there other than just the hunting itself. And the locals know where the fish are. With any kind of low water conditions on the St. John you can start at Nine Mile and name the places where the fish are pooled in. This is where the Allagashers are going to be fishing. I am one of these people. I came from here. I like to think I'm a good adversary.

Coyotes were not found to travel or hunt appreciably in packs. Most (deer) kills were made by paired coyotes. Once physical contact was made by a coyote the prey never escaped, suggesting that heightened aggression may result from such contact. Of the deer pursuits investigated, paired coyotes were successful 79% of the time.

"The Physical Characteristics, Taxonomic Status and Food Habits of the Eastern Coyote in Maine" by Henry Hilton presented as a thesis for the degree of M.S. in Wildlife Management August 1976, University of Maine at Orono.

In 1971 when I first got here, I talked to the native trappers who are mostly Canadian and they mentioned the *loup* (wolf) and that it had been here a long time. Although I did not really believe in wolves, I had seen tracks I couldn't account for.

Then one day on the river my wife was with me and we were at Seven Islands late in the afternoon, and we heard a screeching almost like a loon starting up. Jeez, I listened. I never heard anything like that before all my life in the Maine woods. I looked up river about half a mile with my binoculars. There were four or five little puppy looking things running around on the bank and a big one setting up on the bank. I started the motor, got to within 50 yards, and with 50x binoculars I knew what I was looking at. The young ones were yipping, that was the strange mixture of sound. There were two adults and 5 or 6 pups. That was in '71. I got out and walked up the bank and got to within 30 feet of the female. It was a coyote.

I had talked to a lot of Maine trappers and woodsmen and they hadn't even mentioned anything about this. I talked to the Jumping Frenchman from Nine Mile and he said "Oh yes, the loup." His father had killed one 50 years ago and I wonder whether the animal could have been living here this long. Nothing ever gets documented out of this country. No English writing, it's all French that's been coming here and going back. They were well aware of the loup except that no one seemed to be aware of them on this side.

In my work I found where they were killing deer and I found real big tracks. Then I started seeing them in the wild. I could see where the Canadians could call them wolf, because a 55 lb. male coyote in the winter, fur all standing out in the cold, looks like an 80 lb. wolf.

So I contacted Fish and Game to get a scientific collectors permit and see if I could trap one. I trapped a young one, I guess it was the summer of '72. I took it alive and built a pen for it. The University identified it as the Eastern Coyote and the furthest point north in the U.S. one had been taken.

I got better at catching them and started getting adults. I got penicillin and supplies from a vet with funds from the Fish and Game Department. I was catching them in a steel trap and I had to mend their foot. They would stay about a week until their foot was healed up and then they would go. Their ability to escape was uncanny. They would rarely move. They would eat and drink all right. I had to hold their head down to work on their foot. I learned they could tear heavy gauge wire fencing and push out boards in a fence and even slip through double-boarded walls. They popped out a board at the top, went down between the wall and popped out a board in the bottom. I lost eight of them that way, uncanny how they can find a way out of a pen. They seemed able to figure out their situation and then attack the weakest point. They could get away regularly.

I found the best trap was a blind, set near a place where they made a kill. The traps have to be boiled and de-scented. I wear rubber gloves and boots and put canvas down and make sure there is not a trace of scent anywhere around.

I had been getting letters from the University saying the coyote did not hunt deer, that they took dead deer, that they were not a predator. But I had seen coyotes hunting deer. The problem is they were relating this animal to the animal out west, the Washington coyote. It's not the same animal. I took a litter from a den at Seven Islands and there were seven pups. I was in touch with a young man, Henry Hilton, at the University who was studying coyotes for his master's degree. He came up and found where they had taken deer in good health. He saw for himself the coyote is a predator, it's not like the coyote out West.

Hilton took the five pups I had here to the University, and they were flown directly to a behavioral expert at the University of Colorado. He observed the pups to relate their genetic background to their behavior as pups. Dogs do certain things, fox, wolves – all exhibit certain characteristics perhaps unique to their species from birth to about two months old.

They said this animal was 80% coyote and 20% wolf – that's a scientific expression that there has been a contribution to the gene pool from a wolf population. This animal doesn't breed until it's 2 years old; neither do wolves. Coyotes out West will often breed the first year. Perhaps we have witnessed an evolutionary process in our life. Sometimes he runs 20 pounds heavier than the western coyote. He's much more of a predator. Two or three of them will kill a 200 lb. deer.

Not too long ago I was in the woods and it was about 2 o'clock on a dark and cloudy afternoon. I heard a coyote howl. It was about 500 yards away and then I could hear another howl only about 50 yards away. There were five coyotes separated by about 50 to 100 yards apart moving through a swamp. They were communicating, I am sure – the one on the left flank and then the one on the right flank and then once in a while one in the middle. I wasn't sure of the number until after I'd checked the tracks where they'd come out, hit a little tote road, and crossed it. They communicated from the right flank to the left flank and a few short yips in between. There was a deer there, it was all written in the tracks in the snow. I'm sure they were saying something to each other.

I don't know the range of the animal, but 10 or 15 miles is no problem. I've clocked them at 40 miles per hour on the road. I've chased them with snow machines on the river and their stamina is amazing. They can hold a full sprint for miles. I tagged a coyote pup and released it near Two Mile on the Big Black. It was caught 70 miles away in a trap near Daaquam. The Canadian sent me the tag.

[more→]

Maine Fish & Wildlife Department

The "loup" – *the Eastern Coyote, 80% coyote and 20% wolf.*

They love beaver too and they eat a lot. I guess two of them in six months will eat a couple of moose, a couple of deer, 25 or 30 beaver, or a couple of hundred pounds of dog food. The University wants to raise several litters. They better get a big enough budget for dog food, boy! It's not good for them, either. They have a loose stool on it.

The coyote is here and very well adapted and super smart and a very good predator. In the winter when the fox and the cats are having a hard time, the coyotes are working together readily killing deer. They are coming through the winter strong. I've seen several litters of seven pups. There is a boom in their population. I think they have been here a lot longer than we have been led to believe. I can say with some evidence they have been here at least 50 years.

Henry Hilton has measured the skulls after boiling them down and he finds our animal is more of a wolf than a coyote. It is not a "coydog." If you breed this animal with a dog you'll have a true coydog. The females of that litter will come into heat in December rather than February like they're supposed to. That's a critical survival factor. Pups up here born in January are not going to make it. The male coydog (a cross between our wild animal and a domestic dog) is definitely an inferior animal. Our wild animal is very different. The female comes in heat in February so the pups are born in the spring. The male participates in raising the pups. A dog does not do that. When I see a litter in the wild I almost always see the male and female also.

I've come down to Seven Islands and heard coyotes on the surrounding ridges making a tremendous racket, like something out of Walt Disney. There were ten people camped on the islands that night. I checked them all the next morning and not one of them heard anything unusual. As far as those people knew nothing had happened.

> *If among all the members of our primate family the human being is unique, even in our noblest aspirations, it is because we alone through untold millions of years were continuously dependent on killing to survive.*
>
> The Hunting Hypothesis
> Robert Ardrey
> Atheneum Publishers, NY, NY, 1976

The coyote is a predator and he's got a right to those deer. And predation is good. There will be a few deer less for the sportsman. The coyote will eat 99% of the animal. They chew the rib cages down to the backbone, chew up the skull, eat all the hide, everything. Clean it all. They are not as efficient as a bob cat at killing but they are effective. They will chase the deer and hit him in the hams repeatedly taking mouthfuls of hair and meat and blood. As the deer runs for an open place – or in the summer as the deer runs for water where he can defend himself – the coyotes keep hitting him in the hams. It's not a pleasant kill for sure. And I think the coyote may eat off him while he's still alive.

There must be a niche for them here in Maine now. Whether we know it or not, there has been a radical change in the woods habitat in Maine. When we had caribou and many moose we had large wolves preying on them. At Seven Islands the place is alive with game, all kinds of feed for coyotes. Along the river in the winter there is a brownish kind of coarse grass. The coyotes eat that in the winter too.

When the coyote comes into an area with a fox population, the fox disappear. The coyote take over. They compete for the same food during the summer months, and in the winter when the fox is having a hard time the coyote is feeding on deer and doing very well. Coyote pups will attack a fox pup immediately, start to shake it and if you don't stop it, kill the fox right away. That has nearly happened twice. That has to be genetic. The pups were not taught that; they had never seen a fox before.

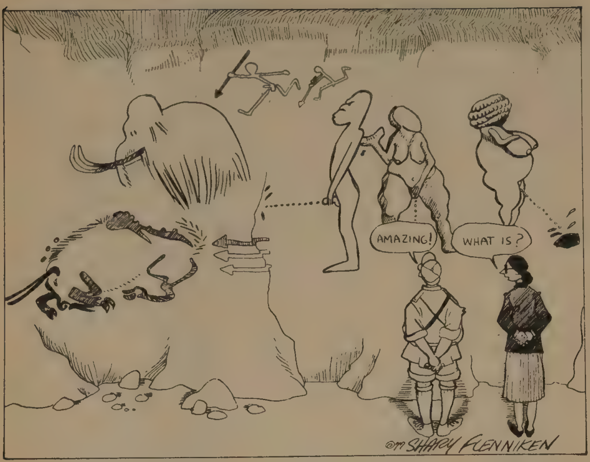
I think the coyote today is filling a natural niche and should be here. Perhaps the less we try to manage it, the better off we are. Out West the coyote does not kill beaver. Only the wolf kills beaver. This animal in Maine kills beaver. He loves beaver. I've seen many times where the coyote has been laying next to an ice hole where beaver and otter come up through. They catch him when he sticks his head up slick as a button.

I'm sure the theory is true that predation is good for the herd, that predators tend to kill the weak, sick, and old. They are easier to get. But they also take a healthy deer if they can. Predation is happening all around us. You really have to look for it, maybe, but it's there, happening all around us. Nature is cruel oftentimes. I'm sure these coyotes can take a moose, especially if it's got the worm sickness.

The coyotes sleep right out in the snow even in terrific snow storms. I've back tracked them to where they have slept at the base of a tree in very cold weather, probably 20 below zero. They have scissor like teeth in the back and when they were pups they would run by my boot laces and snip them off instantly. The female once ran over and snipped through the light plug going into the wall. The sparks flew and she yipped. She'd leap into the refrigerator to get what we had in there. They are not like domestic animals.

And don't they love children. Any child in town can go to the pen and the coyotes will roll on their backs and lick them and play with them and be delighted they are there. If our son cries in the house they start to howl and they get nervous. Several times I'll hear them howl and I'll go out and a few feet away, or even a hundred yards away, I'll find Clem crying. They had heard it. I think they want to get in on the children's play. They begin to yip and "talk" when the children appear or when they can hear them.

One time I was playing with the children on a snow pile, laughing and screaming, sliding down the snow mountain, and one of the neighbors looked up and said, "Oh, my God." There were two of the coyotes, Princess and Tonka, watching us. They were out and they had wanted to go into the woods but the snow was too deep. They do not come when you call them, they are independent. But they do like to play. I knew maybe Tonka, the male, would come to me if I lay down and offered to play. I threw him a glove thinking maybe he would want to play with me with it. He did, and they played with us and later went back into the pen. ■


AMAZING!
WHAT IS?
©77 SHARY FLENNIKEN

No more squat-to-pee

To S.B. and Staff:

I had criticized my spouse for spending the little funds we had on a magazine . . . until I read your recent Co-Evolution. Voluntary poverty and Thomas Merton caught my eye. I am happy with the magazine. What DID blow me away however as I read through it was a simple statement by astronau(gh)t Schweickart . . . on the plumbing needed for women in space.

I was reminded of an early happening. At the turn of mid-century I was a very young girl who had decided in her first dozen years that she wanted to become an astronaut. I concentrated hard on my studies, joined the American Rocket Society and made excellent grades. I desired to take all the prerequisites I might need so that I would not lack a thing on entering high-school or Cal Tech. I made out my course schedule and went to my counselor for an interview. Aside from Science, Latin, Advanced Math, etc., I had asked for Drafting and Work Shop. My counselor read over my chosen courses, told me there were no girls lavatories near the drafting room and shops and assigned me immediately to second year Girls' Glee and Sewing I (again). . . aprons.

******

Another anecdote that I wish to pass on: A few years ago I was visiting students at a free-school where I had taught earlier. My former students (who have gone on to numerous awards in their early maturity) had been the young girls. I had concentrated my teaching on updated traditional women's skills for I foresaw a need. An open mind and a strong imagination and questioning were encouraged. On this day of visiting we all decided on a country walk. In our talking of many things I happened to lament enviously the ability of males to urinate while standing and to direct the flow (a subject we had never discussed before).

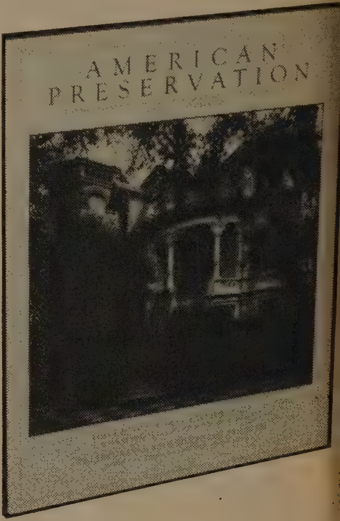
Suddenly the girls broke into a skip ahead of me down the road and as one or two of their "comadres" pointed to this or that rock . . . the others hoisted their clothing, flexed their knees and sent a stream of piss accurately to every target. Well, I paused and considered . . . for it is the little assumptions that make the big differences and the great mistakes . . . I hoped that these girls would keep their wits about them in many endeavors that others may tell them not to attempt. I had to admit I hadn't in this particular area and perhaps more. I reflected, "You've come a really long way, babies . . . perhaps all the way around."

Yours,
Maya (with no plumbing)
Rockies

American Preservation

This magazine on neighborhood preservation is carefully and beautifully put together, has lots of great success stories, useful source information, and lots of shiny color pictures of before and after saving buildings. One recent lead article was "Preservation's Most Vexing Problem: The Displacement of Low-Income Persons" — a comprehensive description of what happens when poor people in run-down houses find their neighborhood becoming desireable, expensive, and they are forced out. This magazine's broad approach to the subject of preservation is a pleasant change from the usual one-sided interest. Combining historic preservation and neighborhood preservation is a better solution for both.

—Virginia Baker
Neighborhood Foundation
San Francisco



American Preservation
(The Magazine for Historic and Neighborhood Preservation)
Porter Briggs, Ed.
$12.00 /yr
(bimonthly)
$3.00 /single copy
from:
American Preservation
P.O. Box 2451
Little Rock, AR
72203

The Contis paid $500 for this house when it was a "structural nightmare." Two years' of work turned it into a dream house and changed their lives. It sold for $10,000. They restored another home in Kalamazoo, and another. Now preservation is their career.

Ha

My aunt was fascinated by her brothers, and the differences between boys and girls. She told me this story.

"One day I snuck up to the outhouse when one of them was in there to get a real good look through a knothole. I was surprised and jealous to see that they could pee standing up. I really wanted to be able to do that too. Of course I had peed squatting in the woods like any other country girl, but I desperately wanted to be able to pee standing up. I took a newspaper with me the next time I had to go to the outhouse, rolled it up, and tried to use it as a funnel to pee into. I couldn't get the stream aimed right, nor could I get it to come out steady enough. It kept dribbling over my hands. Suddenly there I was, with a limp soggy newspaper in my hands, hot pee running down my legs into my socks and shoes. I remember I was crying even before your grandma gave me the lickin for wetting myself. . . ."

Evelyn Eldridge

Celebrations

Minor White was a teacher of mine, of photography as a mystical discipline. He died last year, age 68.

In his work (he coined the term "camerawork") as a photographer, teacher, and editor (of the magazine *Aperture*) Minor not only set and maintained the highest level of excellence in creative photography, he advanced it. In his last years, while teaching at Massachusetts Institute of Technology, he assembled four extraordinary photo exhibits. They were called "Light," "Presence," "Prayer," and "Celebrations."

Here are seven photographs out of the 75 in the book *Celebrations* (1974, 96 pp., $6.95). Also from the same publisher, Aperture, Inc., Elm Street, Millerton, New York 12546, there is a new book of Minor's own photographs and writing, *Minor White – Rites and Passages* (1977, 128 pp., $20). And *Aperture* magazine lives on, $28 a year (four issues). Our thanks to Michael Hoffman at Aperture, Inc.

If other photographers and publishers will send us their excellent work, a good photo section like this may become a regular feature in *The CoEvolution Quarterly.*

—SB

Imogen Cunningham

Minor White

"I think that we have two ends of a stick here . . . a stick too long for anyone to grasp both vibrant ends of at once."

Minor White – Celebration of the birthday of Jesus 1955

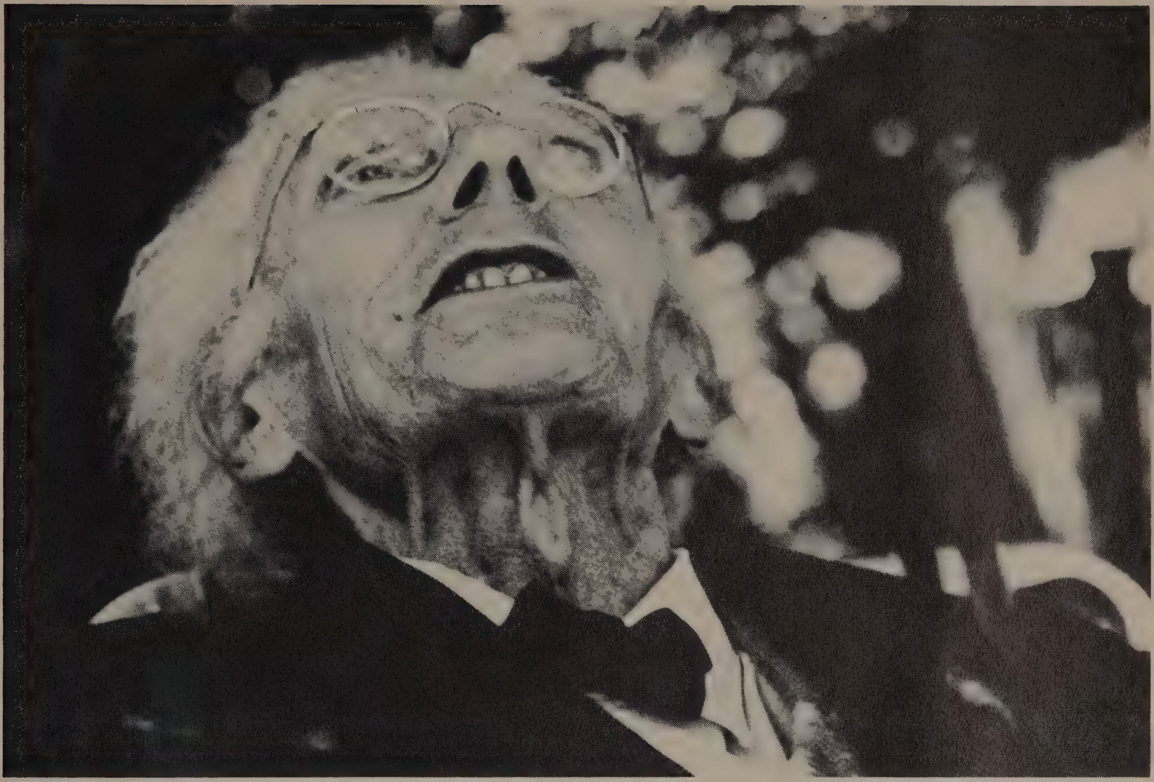
Charles Gatewood

Marion
Patterson

Dan McCormack

Terry Reed

Robert Shaw



Karen S. Rantzman

Celebration

Minor White ■

Company 3

Because of your interest in those tools which are the best available I thought you would like to hear about Company 3 of Aspen, Colorado. They sell equipment for skiing in the backcountry, alpine or cross country.

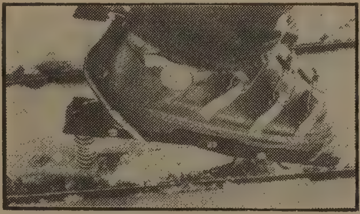
Top of the line in skis for wilderness alpine skiing is the BCP (Back Country Powder). Its strength and lightness comes from the wrapped fiberglass, foam core construction which makes the ski nearly one piece, thus it can't delaminate. It is also called Bumps Crud and Powder due to its ability to track in those conditions found frequently in the backcountry.

The Ramer binding is a revolution in ski technology. Designed by a former space suit and robot mechanisms engineer, it operates as a cross country, climbing, or alpine descent binding with full forward and lateral release in all modes. It will accept any boot, hiking or alpine. The U.S. Army has recently ordered 3000 pr. of BCP's with Ramer bindings for their newly revitalized ski troops.

Company 3 also sells a telescoping ski pole, adjustable for cross country or alpine length. The baskets and grips can be removed and the two poles screwed together to make about a 3 meter avalanche probe.

— Bruce Thompson

Information and
price list from:
Company 3
530 East Bleeker
P.O. Box 1859
Aspen, CO 81611

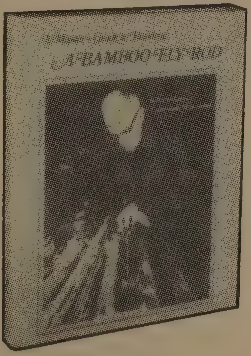


A Master's Guide to Building a Bamboo Fly Rod

Talk about arcane skills! But if you've never had contact with a Master — and there aren't very many of them around these days — then there is much to learn from a book such as this even if you don't give a damn about fly rods. If you do care about fly rods, this big, almost unbelievably lavish and detailed book shows how to do the deed, and why: a rather complete engineering analysis is included.

—J. Baldwin

A Master's Guide to Building a Bamboo Fly Rod
Everett Garrison with
Hoagy B. Carmichael
1977; 296 pp.
$20.00 postpaid
from:
Stackpole Books
Harrisburg, PA 17105
or Whole Earth



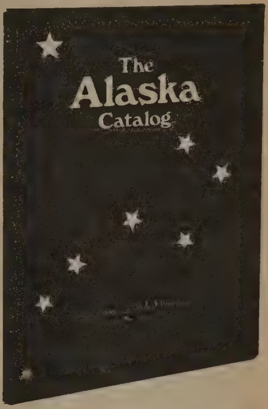
"In a three-piece rod the tip ferrule is usually mounted right at the node of the third harmonic (point at which the energy generated by the normal deflection in a rod is transferred to the next portion of the rod) of the rod vibration. What happens in a three piece rod is that the energy in bending that bamboo comes up and hits that ferrule and bounces back and you get a vibration in the upper portion of the mid section. You have to break that up by stiffening your middle joint to such an extent that that bounce back is taken by the middle joint and thrown back again down through the tip. That's why all your middle joints are tapered very quickly, almost oversized, a short ways back of the second set of ferrules." This harmonic at the ferrule is not a desirable mode of variation and is often called "double action." Therefore, if it were practical, it would be advantageous to build a one-piece rod in lengths requiring two sets of ferrules.

The Alaska Catalog

Alaska books tend to accent deprivation and gold. Alaska Guidebooks tend to stress the joys of murdering rare animals. The tourist brochures assume you have unlimited money and that you'll go home when it gets cold. Exported stories are vulnerable to Texas-style inflation (except for mosquito stories, which simply can't be exaggerated). So what does one do if one wishes to find out what to expect in Alaska? One buys The Alaska Catalog, *that's what. You'll find everything from job hunting tips to patterns for making mukluks, with sources pinned right down to the person's name you should talk to. Unlike many Whole Earth Catalog look-alikes this is excellent in every respect, including attitude. I can personally vouch (from having lived there) that much of their information is just what you'll need.*

—J. Baldwin

The Alaska Catalog
Elizabeth Johannsen, Ed.
1977; 140 pp.
$6.95 postpaid
from:
Polar Palm Productions, Inc.
Box 4-907
Anchorage, AK 99509
or Whole Earth



Parka construction is important. Although you should avoid dressing too warmly, you need wind protection for every square square inch of your body. The parka should be roomy enough, especially at the armholes, so that you can pull your arms out of the sleeves and into the body of the parka. While no commercial gear is perfectly designed, Eddie Bauer down clothing remains about the best available. Partly because they are designed by people in warmer southern climates, mountaineering-style parkas often don't work very well for severe arctic conditions. Many are glorified ski shells, with poorly-designed, form-fitting hoods. Since your head is the key to thermal regulation (if you cool your head, you cool your trunk and feet), hood construction is important. The hood should be tunnel-shaped and fringed with a ruff to provide wind protection for your face and so that air can become slightly pre-warmed before you breathe it. You should be able to slide the hood back and forth without fancy fingerwork, to permit easy cooling and warming of your ears and nose. Sometimes these appendages freeze with little pain; once frozen, they will remain a nuisance for the rest of your life.

Women in The Wilderness

A good quarterly newsletter giving notice of expeditions large and small led by women. Mostly, but not exclusively, in North America. Plus interesting articles.

—SB

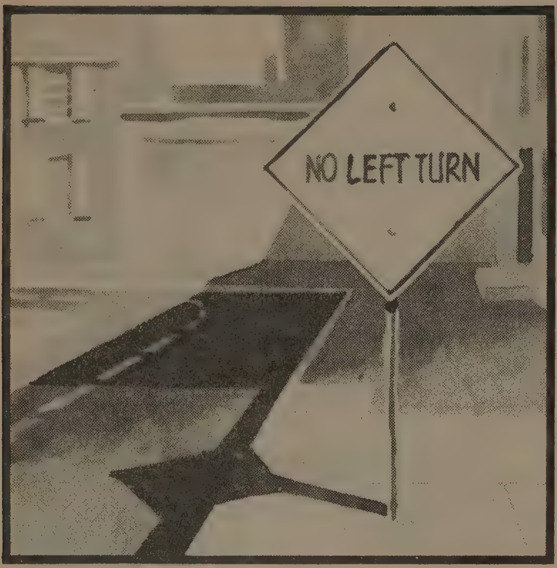
Women in The Wilderness
$6.00 /year (quarterly)
from:
Women In The Wilderness
13 Columbus Avenue
San Francisco, CA 94111

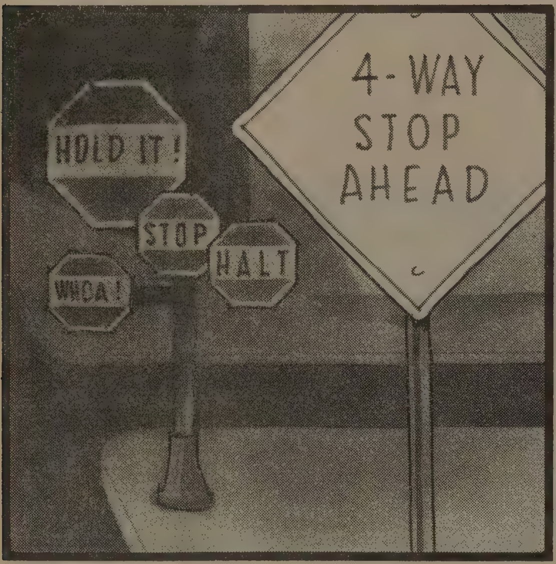
YELLOW DIAMONDS

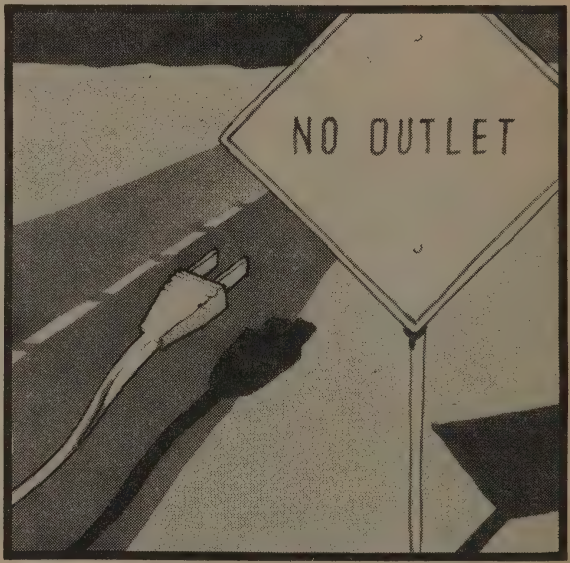
by Malcolm Wells

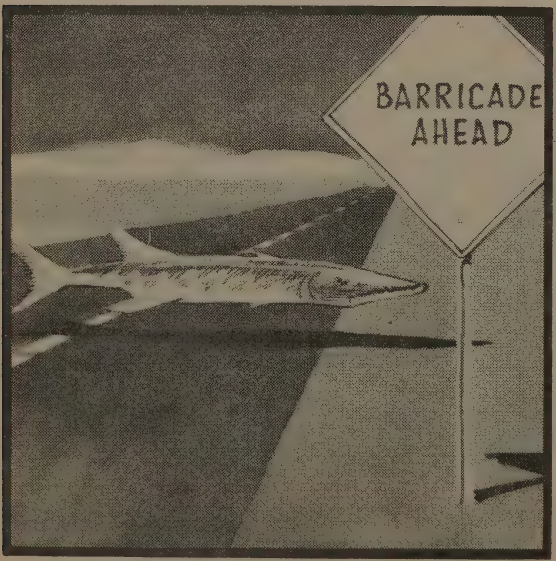
Architect Wells (see his illuminating "Underground Architecture" in the Fall '76 **CQ**) has become oddly obsessed. He is worried that European style traffic signs are replacing "our big funny lovable yellow diamonds full of crazy imagery. What follows is a tribute to the great lemon-colored American gems."

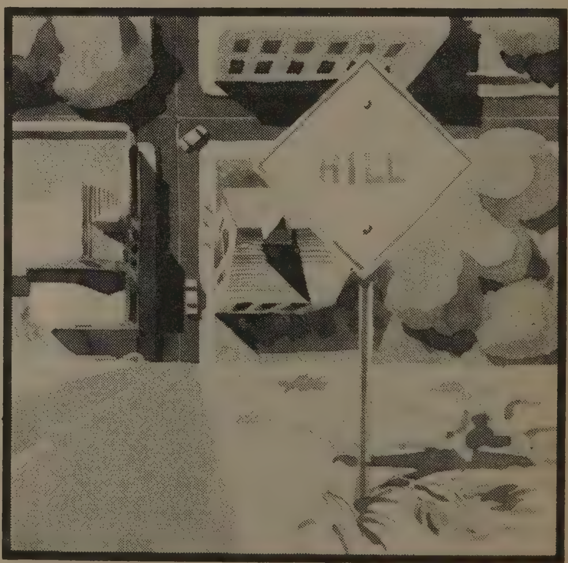
— SB

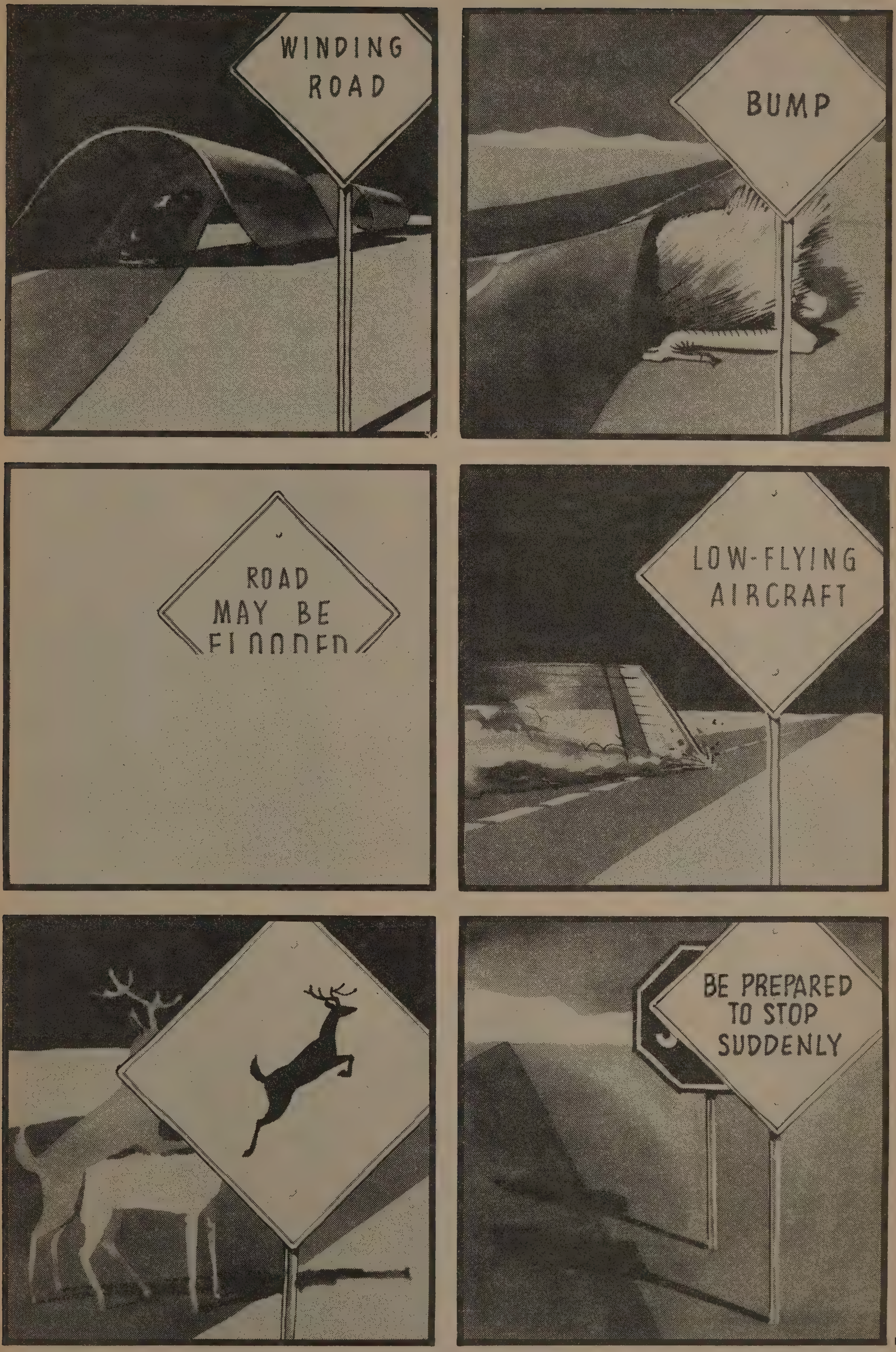











WINDING ROAD
BUMP
ROAD MAY BE FLOODED
LOW-FLYING AIRCRAFT
BE PREPARED TO STOP SUDDENLY

Communications

Heavy Metal

They call it an adult illustrated fantasy magazine. I grew up on Mad *and I call it good stuff.*

—SB

Heavy Metal
(The Adult Illustrated Fantasy Magazine)
$18.00 /yr. (monthly)
$1.50 /single issue
from:
HM Communications, Inc.
635 Madison Ave.
New York, NY 10022

Fine Print

It's probably a sign of advancing age, but I am coming to honor the wellmade book. If you're a similar anachronism, this precise little publication of "the Arts of the Book" will hone your intolerance fine.

—SB

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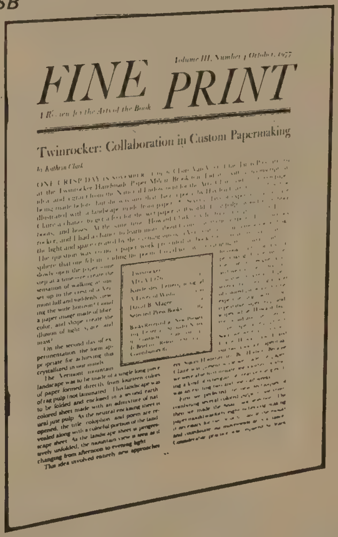

Volume III, Number 4 October, 1977

FINE PRINT

A Review for the Arts of the Book

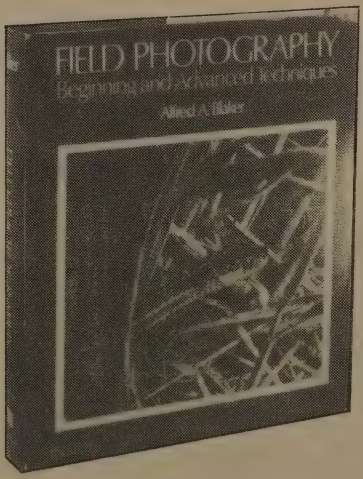
Twinrocker: Collaboration in Custom Papermaking

by Kathryn Clark

Field Photography

I contend that any photographer — creative, journalistic, amateur — can triple their range and pleasure by acquiring the technical skills of nature photography. This here is the definitive book.

—SB



Field Photography
(Beginning and Advanced Techniques)
Alfred A. Blaker
1976; 451 pp.
$19.95 postpaid
from:
W.H. Freeman & Co.
660 Market Street
San Francisco, CA 94104
or Whole Earth

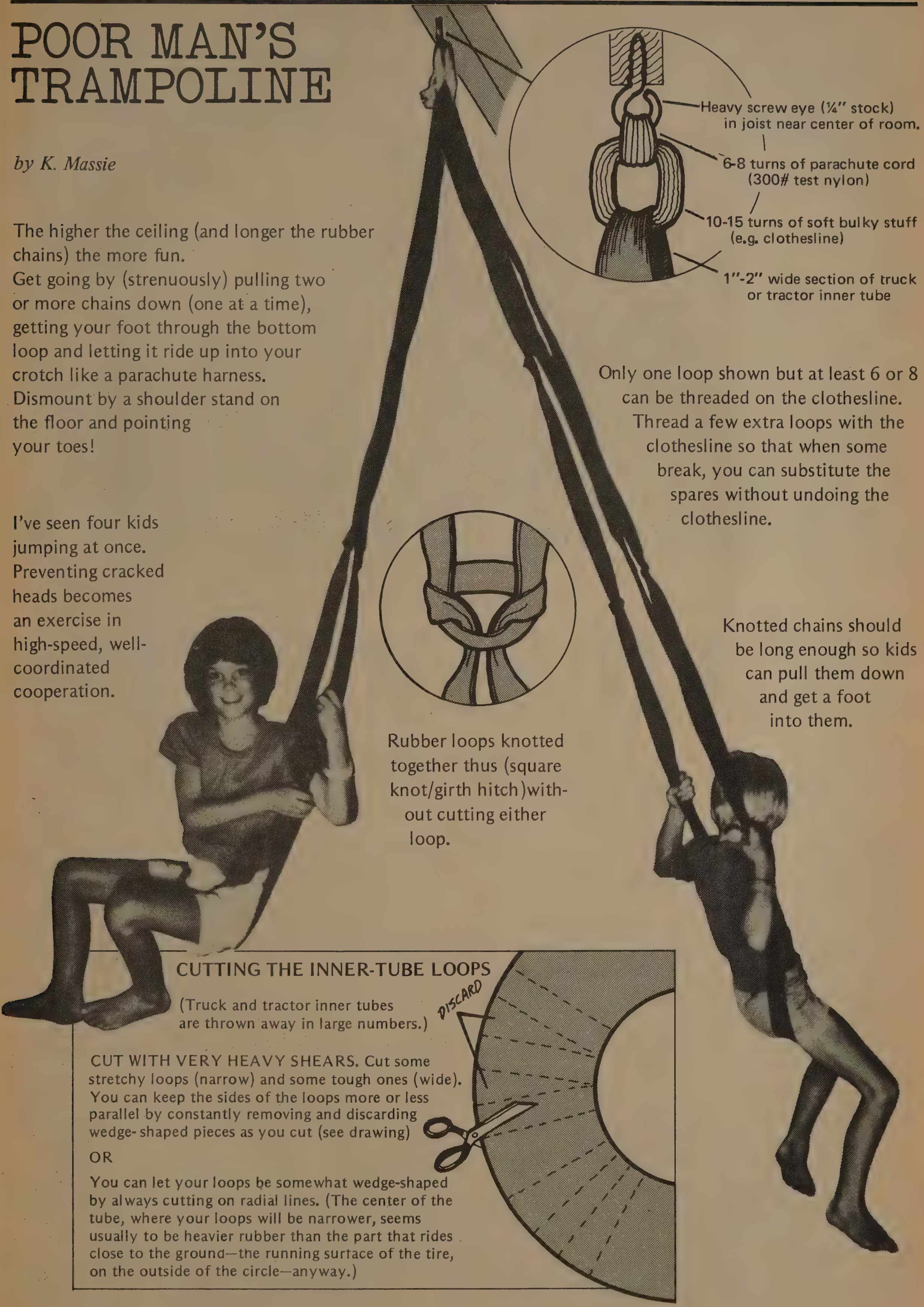
HERE AT LAST, THE END BEGINS.

POOR MAN'S TRAMPOLINE

by K. Massie

The higher the ceiling (and longer the rubber chains) the more fun.
Get going by (strenuously) pulling two or more chains down (one at a time), getting your foot through the bottom loop and letting it ride up into your crotch like a parachute harness. Dismount by a shoulder stand on the floor and pointing your toes!

I've seen four kids jumping at once. Preventing cracked heads becomes an exercise in high-speed, well-coordinated cooperation.


Heavy screw eye (¼" stock) in joist near center of room.
6-8 turns of parachute cord (300# test nylon)
10-15 turns of soft bulky stuff (e.g. clothesline)
1"-2" wide section of truck or tractor inner tube
DISCARD

Only one loop shown but at least 6 or 8 can be threaded on the clothesline. Thread a few extra loops with the clothesline so that when some break, you can substitute the spares without undoing the clothesline.

Knotted chains should be long enough so kids can pull them down and get a foot into them.

Rubber loops knotted together thus (square knot/girth hitch) without cutting either loop.

CUTTING THE INNER-TUBE LOOPS

(Truck and tractor inner tubes are thrown away in large numbers.)

CUT WITH VERY HEAVY SHEARS. Cut some stretchy loops (narrow) and some tough ones (wide). You can keep the sides of the loops more or less parallel by constantly removing and discarding wedge-shaped pieces as you cut (see drawing)

OR

You can let your loops be somewhat wedge-shaped by always cutting on radial lines. (The center of the tube, where your loops will be narrower, seems usually to be heavier rubber than the part that rides close to the ground—the running surface of the tire, on the outside of the circle—anyway.)

California Division of Forestry

AH, FIREFIGHTING

BY RANDY BLACK

> *Randy Black, now 28, fought fires for the California Division of Forestry out of the Sutter Creek station in the summer of '74. Nowadays he's a carpenter in Berkeley. This is his first article. If you want to try seasonal firefighting there's an access-to-jobs section at the end of the piece. First-year firefighters make about $480/month takehome. Now's the time to make your application.*
>
> *—SB*

The pumper truck bounces down the firebreak, pauses, and lurches a little as the gears stop it. "Chock it," yells our captain, jumping down and moving toward the pump. We unstrap ourselves from the crew-cab, underneath the roll bar, and quickly climb down. Someone grabs the chock block on the way and wedges it under a big dual wheel.

I have been watching the smoke for fifteen minutes, ever since we left the highway and started bounding on this semblance of a road. I can't tell what we're up against. There have been fragments over the intercom: requests for bulldozers and aircraft, garbled shouts about brush and trees. The fire borders the road for a quarter mile and probably takes off from there in an expanding arc. But there is so much smoke and noise, I can hardly think. Trying makes things blurry. Only time to react. This is one time I don't mind taking orders.

Our captain moves as though our lives depend upon it, yet he has a reassuring calmness. Somehow, between not rolling the truck or driving it into a ditch, he has sized up the situation. And as the nozzleman opens the brass compartment, he tells us to get ready for a hose lay.

This plan is not new to us. We will follow the fireline, spraying water and adding more hose as we need it. We have practiced it and each man knows his part. The nozzleman leads, controlling the hose. I am next, dragging the hose, making sure it doesn't get hung-up on brush and rocks. There is a clamp in my pocket, a bag of nozzles and joints on my back, an extra hose under my arm. My main function, however, is playing Volga boatman for the nozzleman. The "Hulk", a j.c. tackle, has most of our hose, over

California Division of Forestry

Suddenly, the rattle of airplane engines, so close you can hear the rods knock. Pink slime rains down and covers everything – bushes, grass, our helmets, goggles, Nomex shirts, and even a little of the fire.

a hundred pounds worth. And Rod, the rookie, brings up the rear, using a hand tool on any residual flames. He also lugs a pack of hose coils.

The captain unrolls the first hose and connects it to the pump. He hands the other end to the nozzleman, who walks quickly towards the fire, while attaching the nozzle. He signals the captain once it's tight and the pump is engaged. We are off, jogging along the fireline.

It is hot and steep and immediately becomes slippery. Nevertheless, we soon near the end of our first hose. I fall back to uncoil a new length. You are supposed to do it away from the burned area, which is awkward because of the tall grass. "At least it's downhill," I think, and take a step, tossing it underhand while holding on to the brass; it's like bowling, except you either strike or roll it into the gutter. In training, I frequently sent it wobbling for twenty feet before it collapsed in tangles. This time, surprisingly, I am in complete control and the hose rushes like lightning through the grass and snaps out with a flourish. "Just like snapping a towel."

No time to admire my work. I clamp the pressure off, and while the nozzleman puts the nozzle on the new end, I couple the two lengths. This takes seconds. Loosen the clamp, and the hose becomes a giant snake. We now have another hundred feet to run out. For every two lengths we leave a coil and nozzle on the ground. A special joint (water thief) is inserted, so that we can tap into the line after the fire is circled, and then move inward. If the fire is circled.

We keep moving up the hill, trying to conserve water. Suddenly, the rattle of airplane engines, so close you can hear the rods knock. "Get down!" someone yells, and everyone kneels in the mud, instinctively protecting heads with arms. The sound fades away, leaving an eerie silence and a faint odor of ammonia. Pink slime rains down and covers everything: bushes, grass, our helmets, goggles, Nomex shirts, and even a little of the fire. Mostly, however, they've bombed our own rear position. Everyone gets up to run, and like in a silent comedy, falls down in unison. The nozzleman inches forward, using his nozzle as an anchor, practically towing me. Suddenly we are back in the heat, smoke, and mere mud again.

The wind fans the flames. Our pace quickens. Fire moves faster up hill, something I always considered contrary to nature. I sweat profusely. My eyes are streaming tears from the smoke, and mucus is pouring out my nose like it's an open faucet. I cannot see and I'm getting nauseous. The nozzleman has it better; the spray is a shield that barely allows him to see. I am just trying to keep from being dragged, wondering when I will get that second wind they promised us in training. It is hell on earth. I want to stop, but this isn't a race. I cannot collapse. I feel like I'm inside a penny arcade picture machine, moving frame by frame.

All at once we're at the top. As we begin to move along the crest, the smoke no longer blows into us; my vision returns. I realize how much of my weakness was due to blindness. Now the ground is level, and I'm gaining on my breath.

[more →]

We all need this change. There are trees fifteen feet from the line and only the rainy season could stop that bonfire.

The nozzleman shouts and I see another team making their way towards us. The relief on their faces mirrors ours. They are smiling and cheering wildly, just as we start doing.

"Hey, Sutter Creek," one of them yells, and I recognize the Mt. Zion unit. I haven't seen them since the near rumble at our last volleyball game. God, but it's good to see those bastards. In a moment we are standing next to each other, slapping hands and patting backs, like the allied forces meeting the Russians at Berlin.

"I see they made a direct hit again," says the Mt. Zion nozzleman, sizing up our pink-frosted helmets, goggles, and faces.

Grinning back from a popsicle condition, one of us asks where they were when the retardant was dropped. Everyone laughs; we are on the same side this time. We have all won.

Without more talk, our hose is coupled to theirs. The nozzles are removed, and the ends joined together. We have contained the fire. A hose is unrolled and the brass is passed down the line, ending up with the greenest man among us, who stands looking at it as though he's suddenly become a firehose holder.

I stand soaking wet, covered with mud and fire retardant. I wipe my brow and blow my nose with the large bandana which is almost standard equipment. My breath is coming back and my body is tingling with pleasure.

The smoke lifts, revealing an incredible view. I have been here a month and am finally seeing the mother lode country. Vastness is the word. From our conquered knoll we look at waves of yellow hills, spotted with grey rock formations and islands of digger pines, oak trees and scrub brush. This five alarm fire, only ten acres, looks like a drop of oil in the ocean; but still, it could have been a major spill.

Quietly, we discuss the battle. A hawk whistles, and insects resume their mid-afternoon hum. The air is aromatic, perhaps from bear clover and burned cedar.

One man takes a small bottle of eyewash from his Nomex fire retardant shirt, and, after applying some, shares it. The perfect visine commercial. A canteen appears and is passed around, like a quart of ice-cold beer.

I sigh, take a long pull, and say, "Thank God, there's not much mop-up."

Firefighting. I worked one summer for the California Division of Forestry, living in a barracks and responding to alarms as a member of a pumper truck, a vehicle which carries its own water as well as everything else needed to fight wildland fires. We were sent to brush, forest, grass, vehicle and structure fires, and were moved like pawns over the state (out-of-district fires). We performed the most backbreaking work imaginable. It was undoubtedly the hardest job I've ever had. It was easily the most exciting.

California Division of Forestry

My main function is playing Volga boatman for the nozzleman.

Part of that was timing. I got into it right after college. Firefighting seemed the perfect change from the flabby routine of school. It was like going to war — gambling my young man's body — but for an undisputedly virtuous purpose: defending the environment. While firefighting was exactly what I wanted, it was also precisely what I was trying to get away from.

It had, you see, these incredible extremes. Exhilaration to apathy. There was a constant struggle between the forces of routine and spontaneity. Time was either stopped by the excitement, or else ticked by like the Chinese water torture. I've never felt so free or so oppressed. From feeling like a superman to feeling like a zombie. Torn always between making a career out of it or quitting in disgust.

Consider what happens after the victory I've just described. Sitting on top of that hill is like sitting on top of the world. It's almost mystical. Then normalcy breaks the spell.

A feeling of discontent. Ever been laughing and joking, when a lull in the conversation reminds all present that things are not right? And the laughter fades away like wind in a cemetary. I begin to feel like there is something I am putting off, like studying for an exam.

One man sums it up coldly: "Yeah, but there's always some mop-up."

There's a sad nodding of heads. Easily the most tedious aspect of firefighting, mop-up consists of constricting the fire to where we can safely leave it. It's an aggravating task done in slow motion, in complete contrast to the previous whirlpool of sensations. Damn it, we should be celebrating. It's like washing dishes while you eat.

The thoroughness is unbelievable. Logs are methodically broken apart and water slowly run along the cracks. Continued smoke means further dissection. Large logs are dragged deep within the burned area where they can smolder harmlessly. The firebreak, hacked in by a convict crew, has to be scraped clean of all roots and vegetation. We're a chain gang of boy scouts with Smokey the bear as straw boss.

There is nothing exciting about mop-up. It's done soaking wet without the fire's warmth. We are filthy, hungry and exhausted and often work into the night when the cool air causes stiffness and fevers. Mop-up takes ten times as long as actual firefighting. Conditions get colder, wetter, and more irritating. The camaraderie of the hose lay never existed. The authority of the redneck officers, previously respected, is now resented.

The worst part is not knowing when you'll finish. You know about the long drive home with the night air blowing through your wet clothing. You realize that you must re-outfit the truck upon arrival. Gas and oil it, replace the tools and hoses, make sure the tank is filled, and (God forbid) flush it out if it's gotten too cruddy from siphoning cow ponds.

While you stagger through mop-up, you remember that the fire retardant must be rinsed off the trucks. You begrudge that meal you were just sitting down to when the alarm sounded, and the one you are missing right now.

Sometimes there will be a meal waiting for you, but likely as not the cook has gone to bed, and the crew sent over to cover your station has already had to leave. So now you have to cook. Is eating worth it? Well, you don't have that choice. You can't just excuse yourself and crawl carelessly between the sheets. Eating is mandatory. It's sort of like having to fuel the trucks, and that thought scares me. I mean what happens if the alarm goes off again? Before morning? How about before you finish dinner?

However, if all goes well you can eat, wash the dishes, mop the floor (paying special attention to the black scuff marks which might alienate the cook and cause a rash of leftovers), and then fall filthy into bed. Showers are not mandatory.

The CDF (California Division of Forestry) does try to take care of its firefighters. It's just that you really can't be organized for a forest fire. And while they try to provide steaks and a chance to sleep, all too often you work back-to-back twelve hour shifts and eat "rats" (army rations) if you're lucky. You can't last long eating them; any firefighter will tell you that.

You fill your stomach whenever you can. I remember patrolling a firebreak, riding in the cab. Flames on either side of the road and trees going up like matchsticks. The captain munched a pilot biscuit; the nozzleman guzzled fruit cocktail. My problem, cringing in the middle, was that I had very little appetite.

On the flip side of firefighting, this danger leads to excitement, camaraderie, and mystery. All in all, these factors outweigh the suffering and boredom. We are often reminded of this fact.

Even when we are not on the fireline, for example, when our routine becomes pointlessly paramilitary, our schedule includes getting ready for the next fire. It's ironic that such a structured routine is preparation for near chaos. I am less apathetic about my duties when I consider their consequences. Besides, everyone is aware that the alarm will eventually go off and turn our ordered existence upside down.

Every morning, we spend about three hours combing through all the equipment from carburetor to flashlight batteries. The engines are warmed up, electrical systems checked, retreads scrutinized for signs of unwinding, and an experimental blast is sent through the horn. Things are double-checked that don't need to be checked at all, for overlooking them causes a full day of worrying. Make sure a nozzle hasn't disappeared in the night. Send a small charge of water through the auxiliary pump to see if it's gotten clogged from a day's inactivity. Run out the quick line (a hose and nozzle mounted on a large spool) to make sure no one's tied knots in it.

It's essential to refill and test the back pumps, count the number of hoses, put new water in the canteens, and ice in the cooler. Like surgeons we scrutinize our unique assortment of hand tools for dullness. There is nothing more aggravating than to try and put in a handline firebreak with a dull McCleod (old tool — half hoe and half rake).

After checking the equipment, we spend the rest of the morning washing old hoses, repairing hand tools, and cleaning the trucks.

About the trucks. I won't hear a word against a "fire truck heavy." I'm sure that sailors regard their ships (and pilots their planes) in the same way. They're small, able to move over anything, and yet can carry six men and deal with any emergency. They are a cabinet maker's dream. Numerous compartments fitted with necessities: 800 gallons of water, two pumps, hose coils, brass, hand tools, a Paul Bunyan type buck saw, bolt cutters, fence menders, first aid gear, respirators, canteens, rations, helmet lamps, a hose winder on the rear and a winch on the front. The list is infinite.

Occasionally we go for long periods without a fire. During this time it's possible to forget why we're here. Firefighting becomes like any other boring job. Busywork from eight to five, coffee breaks every two hours. Now and then our officers take time off from their pinochle games to offer encouragement. Sometimes, it gets worse than other jobs.

It is late August and there hasn't been a fire for ten days — strange, because right now California is like a field soaked with lighter fluid. The heat would be more bearable if our work wasn't so meaningless. Our superiors (sadistic assholes) are applying that stupid maxim, "keep them occupied," so we spend our time in the fields, hoeing weeds.

During this miracle interlude, we have shingled two buildings, painted the garage, sharpened and repaired all the hand tools, washed a mountain of dirty hoses, ripped up a cement foundation and put in a new patio. Now we are attempting to eradicate every weed on state property. It's funny how we reduce the "fire hazard" of these badlands only when there's nothing else to do.

We are leaning on our McCleods watching the air over the mottled yellow hills appear to evaporate. I am thinking about a beer in an air-conditioned Jackson bar. Everybody is thinking about cooling off. We

California Division of Forestry

In the next second the alarm might go off and we could be dispatched up to Yreka or down to San Diego. I might be riding in a helicopter tonight or lying in a "paper" sleeping bag in some orchard.

watch enviously as the inmate crew (which has been helping us kill time) lines up to use the barrack's restroom. They go in, one by one, and get about five minutes to themselves before the guards start to hassle them.

I have never been so bored. Everyone volunteers for KP in order to get into the air-conditioned kitchen. I would do anything to escape this heat. I wish I was back painting the garage. Or doing some clerical job, or working in a factory. I do not, however, wish I were back in school. At least once a day there is a false alarm which sends us scurrying for the trucks with incongruous grins. Why continue? The only difference between us and the inmates is that we can quit. I think a great deal about quitting.

What keeps me on is the knowledge that this slow-death routine could be blown to bits in an instant. In the next second, the alarm might go off and we could be dispatched up to Yreka or down to San Diego. I might be riding in a helicopter tonight, or lying in a "paper" sleeping bag in some orchard. It's strange to wish for a fire, but this boredom is intolerable. Shamefully, we even joke about starting a fire. If only the quick call would go off.

How to become a seasonal firefighter

Select the region you want to work in and apply early! Federal, state, and other agencies have a surplus of applicants and they often make geographical limitations (i.e., the Forest Service allows you to choose just two forests). Your best bet is to consider, in December, a large, high fire risk area — one that will require many firefighters when summer comes.

The following agencies hire seasonal firefighters. However, your best chances are with the U.S. Forest Service, the Bureau of Land Management, the California Division of Forestry, and the departments of forestry for other states.

California Division of Forestry: Open application varies from year to year, but start inquiring in December. Contact either Division of Forestry Personnel Office, 1416 9th St., Sacramento, CA 95814; or State Personnel Boards; or Employment Development offices. One advantage to the CDF is that you can apply to all five districts.

United States Forest Service: Information and addresses can be found in the "Federal Government Summer Job Announcement" (No. 414), which is available in early December at all U.S. Civil Service Commission Federal Job Information Centers. Application deadline — Feb. 15.

There is also a requisition program (SSEP) that recruits students in forestry and related fields. Check college placement centers.

Bureau of Land Management: As with the USFS, consult announcement No. 414. The BLM hires many firefighters to protect federal lands. Application deadline Feb. 1.

The quick call is the alarm that sends you running for the trucks. It always seems to go off at the least opportune time. Like when you sit down to eat dinner, or when you're working on the roof and some idiot moves the ladder, or when your hands are covered with forest green paint, or when you've just misplaced your gloves, or when you sit down on the toilet. Anyway, this alarm goes off with the authority of an air raid siren, and you are expected to be on that truck in sprinter's seconds, brother, wearing your helmet, goggles, nomex shirt, gloves and seat belt. Definitely, your seat belt.

Since the alarm alerts all units, there is a chance you won't be sent, but no one goes by the law of averages. If you're not dispatched, you sit down and catch your breath and let your heart stop pounding. Then try and finish your chores before the inevitable.

Occasionally someone misses the truck. That, in fact, is the biggest fear a firefighter has. I would rather inhale burning poison oak. It's not the humiliation or the possible loss of job. You have committed the ultimate failure. It's entirely up to the firefighter to be on that truck. The captain doesn't call roll. You have about half a minute and punctuality is required, to the second.

Once anchored in the crew cab the fun begins. We peel out to highway 89 with gravel flying and siren wailing. The wind slaps at the sweat from a two hundred yard sprint on a one hundred degree day and turns it into ice water. For awhile, you can enjoy the ride.

Screeching around corners and barreling through red lights, I regain my respect for our redneck driver. Nonetheless I can't help but glance at the thick roll bar directly over me. A slight mishap would send this sixteen-ton sports car tumbling into the canyon like a boulder.

Our captain turns the siren on when we approach another vehicle. It's fun to watch huge logging trucks almost ditch themselves. I have not forgotten the times they played tiddly winks with my Volkswagen.

Entering a sleepy gold rush town, the siren goes on again. The nineteenth century streets suddenly resemble an ant hill hit by boiling water. Only we are the heroes, and those people not trying to get off the streets are choking the sidewalks to see what's going on. Young men watch us enviously, and women smile as though we are Hector and the Trojans. Best of all, children wave and run after us — just as we did a few years ago.

The change from city to country is abrupt, and occurs precisely as the siren is turned off. It's like being pushed into a dream with your eyes open. The countryside is striking, something like Maine, they say.

Everything is so vivid. Not like usual, when I feel as though I were thumbing through someone's collection of black and white family photos. Now I am seeing this land for the first time, and it looks nothing like Maine. Each valley is a little world. Yellow hills and grey rocks. Farm houses tucked into cool little meadows. Tumbledown stone walls, resembling ancient castle battlements. Dusty green trees and brown brush huddle together, seeking protection from the land's desert tendencies. A solitary hawk presides over a sky so blue it hurts to look at it.

I am in the middle of a Van Gogh painting. The colors are either explosive or bottomless. Shadows beckon with mystery. It is a fantasy world that is quite real.

I am nudged by the man next to me, who points toward a spiral of smoke. It always seems small from a distance. Once you get there, the whole world is on fire. My body is a hand grenade, the pin pulled.

Ah, firefighting. Such a strange way to make a buck. When I was struggling to finish school, hanging out in the placement center like a GI in a travel agency, I never dreamed it would be so exhilarating. And also like the bad side of the army. It was, after all, my closest brush with the military since being drummed out of the traffic patrol in grade school. Surprising to find it enjoyable.

I groan, drop my McCleod, and ask someone how long to break time.

"Ten minutes less than the last time you asked."

"Discover eternity," I grumble, "join the CDF."

The dullest job in the world. But who am I kidding? I won't quit. I might even be back next year. ■

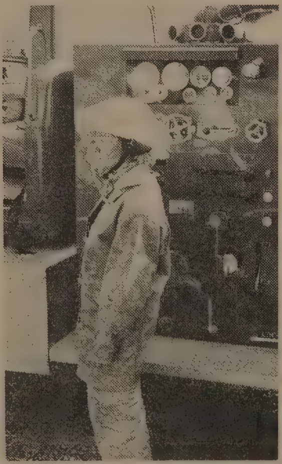
State Departments of Forestry: Write to capital cities, starting in December. Oregon and Washington in particular use a lot of seasonal crews.

State Department of Parks and Recreation (California): Send for information on "seasonal park aids" to P.O. Box 2390, Sacramento, CA 95811.

California Conservation Corps: Now requires a one year commitment, but may hire seasonal workers next year. Recruits mainly through high schools and employment offices. Write: CCC, 1530 Capitol Ave., Sacramento, CA 95814.

Regional Park Districts: Seasonal employment varies with the locality, but all expect early applications.

Military facilities in rural areas: A long shot, but they occasionally hire civilian firefighters. Contact individual bases.



Brand

Gradually women are infiltrating the fire crews. This is Stephanie Black at the CDF Fire Academy's six-week Engineer course. As Engineer she will drive the truck and boss a crew.

Business

Prince Charles in Sacramento with Governor Brown.

Gossip

Prince Charles, future King of all England, came through California recently and had a highly visible lunch with Governor Brown. The major topic of conversation was Space exploration, so The Governor gave The Prince a copy of Space Colonies, *our new book. If that seems a bit stingy for a State present, it was matched by His Royal Highness' gift, a 5 X 7 color photo of himself.*

At Penguin's behest we've already done a second printing of Space Colonies, *making it 37,000 copies in print. We're pleased with the book — it remains to be seen what the market thinks. Meanwhile Peter Warshall is assembling* Watersheds *for publication later this winter — half of it new material.*

CQ *has suffered an ironic loss in the departure of Don Ryan to be assistant cartographer for a* California Water Atlas *now in progress. The irony is that I initiated the project at the Governor's office. When head cartographer Bill Bowen offered Don twice the money ($17,000) he was getting from us, what could Don say, what could I say? Oh well, it is doubtless indeed All One Book, and Don is well positioned to enhance what may be an unusually interesting chapter.*

New in the shop will be Patty Phelan, 25, who recently entrepreneured an access-to-services directory of Berkeley called Savvy. *Her employment here will be half paid for by CETA (Comprehensive Employment Training Act), which demolishes the last of our capitalist pretensions. Patty's job title is "projects." At a recent Space Industrialization conference she handled a* CQ *booth which did $1000 worth of business in* Space Colonies *and subscriptions in three days.*

In other staff news, Isabella Kirkland won a billboard-art competition along with 19 other artists, and now her sculptural painting glows over downtown San Francisco. Later it will probably go on national tour. Carol Kramer is back among us on paste-up and also glowing, being 5 months pregnant. J.D. Smith is in Junction City, Oregon, helping Small Farmers' Journal *cope with success. Dan O'Neill and wife Denise have produced a baby cartoonist named Owin Daithi ("Quick John") O'Neill. And new in the subscription corner is Dick Fugett, 41, a marathon runner formerly with the Peace Corps, 101st Airborne, Venceremos Brigade, and RCA.*

The Acorn People *by Ron Jones (Winter 76-77, Spring 77* CQ*s), is now in book form — $1.25 from Bantam (paper), $4.95 from Abingdon in Nashville, Tennessee (hardcover). Neither publisher, despite insistence by Ron, mentions that the material previously appeared in* CoEvolution Quarterly *and* Psychology Today *— and they're using our Tom Parker illustrations. CBS has optioned "The Acorn People" for a possible two-hour TV special next fall. Meanwhile Norman Lear's project of making "Take As Directed" (Fall 75* CQ*) into a Broadway play is somewhat stalled. If you'd like to see a California high school go Nazi — "The Third Wave" — on the New York stage, write encouragement to Lear at Metromedia, 5752 West Sunset Blvd., Los Angeles CA 90028.*

Thanks to Larry and Scoop handling The Broadcast 94 pages of this issue, I've been getting some pieces of vacation. After the simultaneous squeeze of the Fall CQ, Space Colonies, *and the Governor's "Space Day," I was bushed, frazzled, whipped. I needed (I wrote):*

To wake up under weeds,
the sound of early traffic over there,
eat something dry, sip canteen water, piss,
and resume walking at no angle to anything,

Re-informed by the glimpse of the mountain
behind and above the mountains,
Analogue, Mysterious,
which I know in part by its other knowers.

It's been years since the path faded.
Many of the trekkers have settled for less.
The new ones seem naive because they are
better informed,
but all they are is younger.

And they are too many,
and I am too few,
lazy, scattered, easily bored,
successful, ambitious,
scared.

Desert suck me dry.
Give me a shaping wind
to fit me to that particular mountain range.

You cannot both be and defend
a mountain range.

—SB

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9. The Purpose, Function, and Nonprofit Status of This Organization and the Exempt Status for Federal Income Tax Purposes Have Not Changed During Preceding Twelve Months.

Thank you

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and Two Anonymoose

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**By virtue of returning payment for interview*

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The Retaining Subscriber list includes only those who became retainers since the last issue, as of 11/10/77. Retaining and Sustaining Subscribers get their magazine delivered first class (airmail) for a year. Maniacal Subscribers get The CQ *for life. Each of the donation amounts (minus $8) is tax deductible.*

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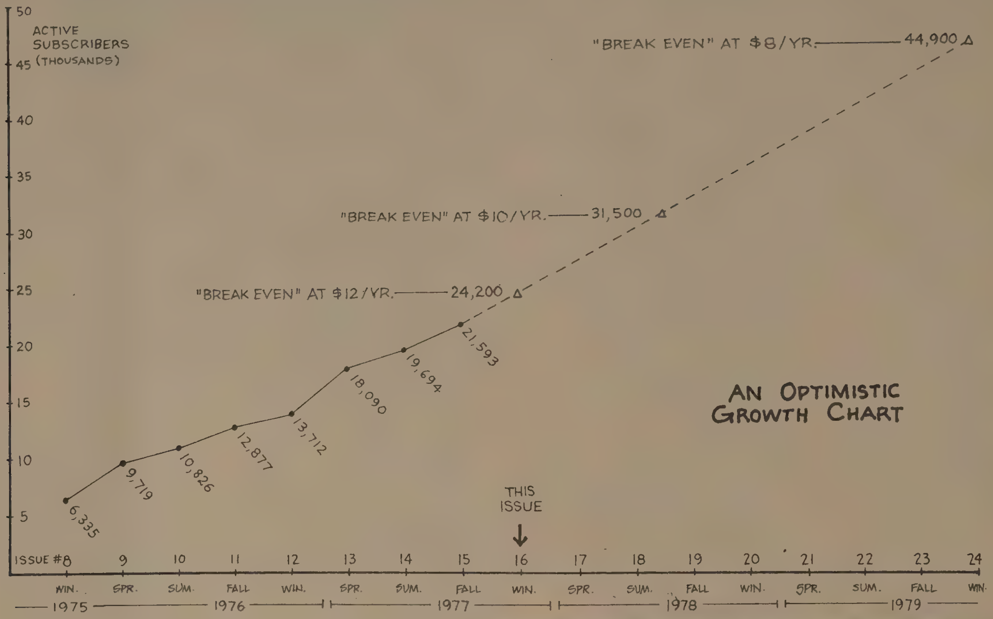
10. Extent and Nature of Circulation:	Average No. Copies Each Issue During Preceding 12 months	Actual Number of Copies of Single Issue Published Nearest to Filing Date (as of filing date)
A. Total No. Copies Printed (Net Press Run)	37,250	55,000
B. Paid Circulation		
1. Sales through dealers and carriers, street vendors and counter sales	10,600	15,100
2. Mail subscriptions	15,903	19,363
C. Total Paid Circulation (Sum of 10B1 and 10B2)	26,503	34,463
D. Free Distribution by Mail, Carrier or Other Means Samples, Complimentary, and Other Free Copies	181	331
E. Total Distribution (Sum of C and D)	26,684	34,794
F. Copies Not Distributed		
1. Office use, left over, unaccounted, spoiled after printing	9,540	20,073
2. Returns from news agents	1,026	133
G. Total (Sum of E, F1 and 2 — should equal net press run shown in A)	37,250	55,000

11. I certify that the statements made by me above are correct and complete.

(Signature) Andrea Sharp, Business Manager

CQ PRICE GOING UP TO $12/year, $3.50/issue, EFFECTIVE 31 JAN. 1978.

YOU MAY SUBSCRIBE, RENEW, OR EXTEND YOUR SUBSCRIPTION (up to 2 years) AT THE OLD RATE OF $8/year IF YOU DO IT BY 31 JAN. 1978.



Here's the argument: at $12/year we can stop losing money this winter; at the current $8/year we wouldn't break even until 2 years from now, if then (if ever).

Mike Young, who did the analysis, explains it this way. We have two kinds of costs — one goes up with the number of subscribers (processing, mailing, etc.); the other supposedly stays constant at about $210,000 a year (editing, contributors, paste-up, etc. — actually it goes up too).

At $8/year, $3.32 must be spent in subscription fulfillment. That leaves $4.68 a year to make the magazine. Taking the present "constant" cost of $210,000 and dividing it by that $4.68 per subscriber yields a number: 44,900. That's the number of subscribers needed to break even. We have 21,593 subscribers now. At present growth rates we won't have 44,900 subscribers till the end of 1979.

If we charged $10/year, spent $3.32 on fulfillment and had $6.68 to pay for the constant $210,000, we'd break even at 31,500 subscribers, sometime late next year at best. But the costs and hassle of changing the price would nearly offset the gains, and inflation might force another price change all too soon.

At $12/year we have $8.68 from each subscriber to divide into that bloody $210,000, requiring only 24,200 subscribers, which we may attain sometime this winter. In other words $12/year is the real cost of what we do now. The $8/year you paid in the past was subsidized by our "losses" — $165,700 (about $11,000 an issue) in the last four years, which came from Whole Earth Catalog *income, now dwindling.*

As for retail sales in bookstore and newsstand, we have been selling the $2.50 CQ *to distributors at $1.25 a copy. Since each copy costs about $1.50 apiece to make, we lost $ .25 on each newsstand sale. At the new price of $3.50 we'll sell copies for $1.75 each and hopefully make about $ .25.*

All of this, of course, is over-precise fantasizing, but our losses and need to break even are not, so we're grasping the statistical nettle where we can. If it's any consolation, here's one more statistic. The admirable new magazine Quest 78 *costs $12/year and prints about 398,000 words a year.* CQ *will cost $12/year and print 464,000 well chosen words.* Quest 78 *carries advertising; we don't.*

By way of thanks to our subscribers and newsstand buyers for bringing us this far, you're invited to extend your subscription up to two years at the old rate of $8/year ($16/two years) — or to start a new subscription for yourself or friends. Please do it before the end of January, 1978.

Wooh.

—SB

The CoEvolution Quarterly

Broadcast Editors Larry Lee, Scoop Nisker

Usual Editor Stewart Brand

Office Manager Andrea Sharp

Assistant Editor Anne Herbert

Subscriptions & Back Issues Dick Fugett, David Burnor, Mike Young, Isabella Kirkland, Rosanne Kramer, Ben Campbell

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Production Manager & Paste-up Susan Goodrick

Paste-up & Camera Andrew Main, Carol Kramer, Jay Kinney, Al Wasco

Soft Tech & Nomadics J. Baldwin

Land Use Peter Warshall, Richard Nilsen, Rosemary Menninger

Craft Diane Sloat
Art Robert Horvitz
Medical Tom Ferguson
Personal Computers Marc Le Brun
Learning Linda Williams

Illustrations R. Crumb, Jay Kinney, Doug Wellman, Bill Netzer, Gilbert Shelton, Shary Flenniken, Carol Kramer, David Wills, Tom Parker

Proofreading Michael Lewis

Mailing Services Mailing Management, San Francisco
Mailing List Services, Berkeley

Printing Fricke-Parks Press, Fremont (body)
Hatcher Trade Press, San Carlos (cover)
A. L. Lemos Co., San Francisco (bindery)
Glue-Fold Co., Menlo Park (envelopes)
Chong Lee, San Francisco (photo prints)

CoEvolution Quarterly — Winter '77 - '78 Financial Report

EXPENSES	Aug.,Sept.,Oct. (Predicted)	Aug.,Sept.,Oct. (Actual)	Nov.,Dec.,Jan. (Prediction)
Salaries and fees			
Office	$ 15,000.00	$ 14,518.01	$ 17,000.00
Production	6,000.00	7,607.27	7,750.00
Editors	12,000.00	8,577.88	12,000.00
Contributors	6,000.00	4,972.00	6,000.00
Office rental, materials, etc.	9,500.00	9,373.71	9,500.00
Phone	1,500.00	1,637.56	1,700.00
Promotion	12,000.00	15,176.00	32,500.00
Printing	24,300.00	24,160.53	29,200.00
	(55,000 copies)	(55,000 copies)	(65,000 copies)
Subscription process and mail	15,000.00	9,839.89	12,250.00
Shipping	1,600.00	902.27	1,000.00
Business reply	1,500.00	1,225.16	1,400.00
Refunds	300.00	203.71	250.00
Total	$104,700.00	$ 98,194.69	$130,550.00
INCOME			
Subscriptions, gifts and renewals	$ 56,250.00	$ 65,134.47	$ 93,500.00
Retaining and Sustaining	6,000.00	6,480.00	3,500.00
Back issues	7,750.00	6,840.58	6,000.00
Distribution	11,000.00	15,693.88	12,250.00
Special (1 time) tax & subscription process refunds		3,262.22	
Total	$ 81,000.00	$ 97,411.15	$115,250.00
NET PROFIT OR (LOSS)	($ 23,700.00)	($ 783.54)	($ 15,300.00)

POINT Financial Report

	PAST QUARTER* Aug.,Sept.,Oct. 1977
CQ (detail above)	
INCOME	$ 97,411.15
EXPENSE	98,194.69
CQ Books	
INCOME	
Penguin-Viking	—
Direct Mail-Order	1,453.47
EXPENSE	
Production & Mail-Order Supplies	3,188.61
Catalog & Epilog	
INCOME	
Penguin-Viking	—
Direct Mail-Order	2,374.45
EXPENSE	
Production & Mail-Order Supplies	11,969.42
Maps, Posters, Postcards	
INCOME	1,626.68
EXPENSE	168.00
Miscellaneous	
INCOME	
Dividend Payment	—
Anonymous gift	4,000.00
EXPENSE	
Point, Miscellaneous	1,649.34
TOTALS	
INCOME	$106,865.75
EXPENSE	$115,170.06

*Next fall we will again report the year's totals.

POINT Balance Statement
31 October 1977

ASSETS	
Cash in bank	$41,589.89
Investments	27,344.75
Accounts receivable	
Distribution	28,229.32
Dolphin Project	8,000.00
INVENTORY	
Back issues, CQ	35,674.08
Maps, posters, post cards	2,275.31
Mail-order LWEC & WEC	6,271.20
Mail-order CQ Books	4,695.00
Penguin inventory	
CATALOG ($1.73)	8,231.34
EPILOG ($1.01)	114,264.33
LIABILITIES	
Accounts payable	—
Deferred SB salary	20,000.00
Subscription liability	89,980.00

'Or Whole Earth'

Under the access of an item in The CQ *means you can mail order it from:*

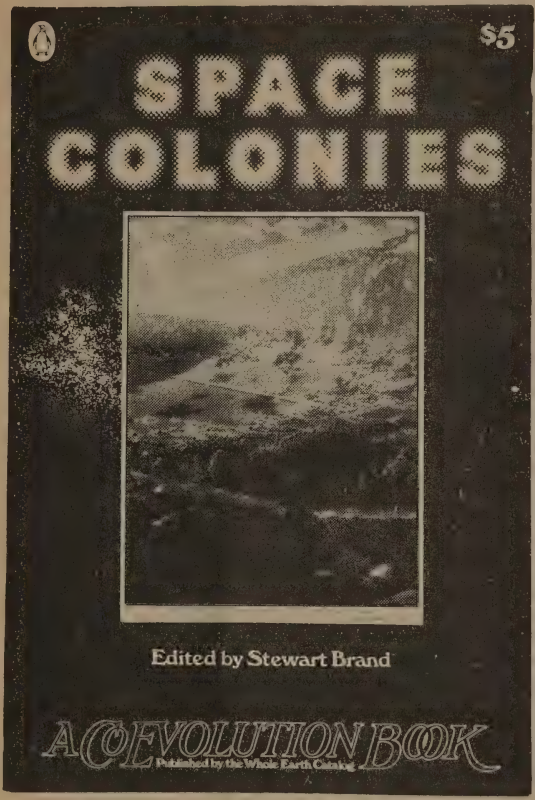
Whole Earth Truck Store
558 Santa Cruz Ave.
Menlo Park, CA 94025

Anything else — letters, material for the magazine, subscriptions, complaints, should be sent to us here at:

The CoEvolution Quarterly
Box 428
Sausalito, CA 94965

"To those who have looked at the night sky and not seen a black wall, blessings. Life proceeds, and spreads before the Sun. Cambridge is turning towards our planet's dawn line, and I must pack."

—*Eric Drexler*



$4

to CQ subscribers

($1 off retail)

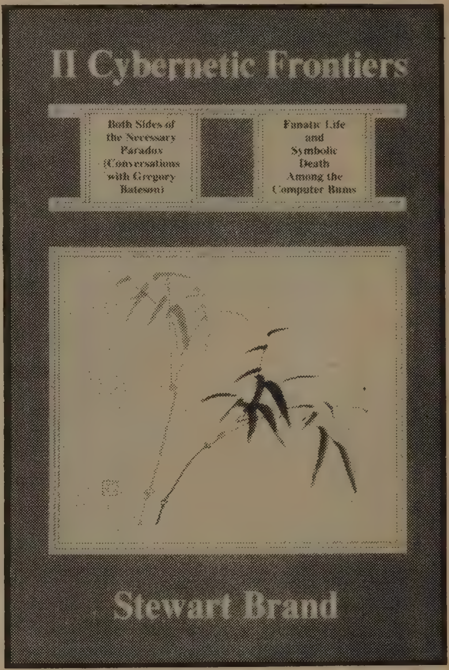
The first of a series of CoEvolution Books, **SPACE COLONIES** *contains the best of our two Space issues (Fall 1975 and Spring 1976, both out of print), cream from other issues, and 32 pages of new material — articles on solar sailing and the space colony research group by Eric Drexler, Governor Jerry Brown's "Space Day", MIT's working mass driver, new interviews (summer, 1977) with Astronaut Rusty Schweickart and Gerard O'Neill by 21-year-old Jane McClure, and new space poems by her father Michael McClure.*

The book is 160 pages, book paper, color covers inside and out, indexed. Available for $4 from us by mail, or $5 at your bookstore (distributed by Penguin Books).

"Job's sin is that he's pious. This is the sin which annoys Satan almost more than any other — Satan being also part of God, an angel after all. Uh huh," Gregory looks to see if I got it. Not yet. "So Satan takes on the challenge to smash Job's piety, and you get the whole series of events. Finally God answers Job out of the whirlwind: *Who is this that darkeneth counsel by words without knowledge . . . Where wast thou when I laid the foundations of the earth? Canst thou bind the sweet influences of Pleiades, or loose the bands of Orion? . . . Knowest thou the time when the wild goats of the rock bring forth?* — those three chapters of natural history. This is the resolution of the dialectic between having your property destroyed and being pious. The correction for piety is natural history."

$2

Postpaid


II Cybernetic Frontiers
Both Sides of the Necessary Paradox (Conversations with Gregory Bateson)
Fanatic Life and Symbolic Death Among the Computer Bums
Stewart Brand

This 1974 book I wrote about my personal saint, Gregory Bateson, and about strange behavior in computer science has, to my surprise, hardly dated at all. So we've bought most of the remaining copies from Random House and offer them at their 1974 price — a buy then, positively nostalgic now.

—SB

"**Two Cybernetic Frontiers** . . . — reworked magazine pieces by a sensitive analyst of science and technology. . . . Brand visits, appraises and portrays the computer hacks: the technicians of the discipline, a legion in support rather than in research whose energy and devotion infuse what is now one of the largest industries in the world. . . . Brand has once again set out how a generation feels that is not passive before the machine. Their stance has its own irony: addiction, like the gambler's."

— Phillip Morrison
Scientific American

CoEvolution Quarterly, Box 428, Sausalito, CA 94965

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Self Order

1 **1 year CQ $8** ($12 after Jan. 31, 1978)	5 **SPACE COLONIES** Book — $4	8 **Whole Earth EPILOG** — $4
2 **2 years CQ $16** ($21 after Jan. 31, 1978)	6 **BIOGEOGRAPHICAL MAP** — $3	9 **Whole Earth CATALOG** — $8
3 Check if this is a renewal	7 **TWO CYBERNETIC FRONTIERS** Book — $2	

4 **CQ Back Issues $2 each** ($3 after Jan. 31, 1978)

Issues: ____________________

(See overleaf for back issues available.)

☒ Please mark in boxes clearly.

☐ **Retaining** —
$30/year. $18 deductible. You get your **CQ** *in an envelope, delivered first class, and we gratefully publish your name and town (unless you say not to). It's tax-deductible because we're a non-profit corporation.*

☐ **Sustaining** —
$100/year. $88 tax deductible. You get your **CQ** *in an envelope, airmail, and we gratefully bless your name and town in the magazine (Unless you say no).*

☐ **Maniacal** —
$1000/life. $988 tax deductible. You get your **CQ** *in an envelope, airmail, for the rest of your life (or ours, whichever comes first).*

All subscriptions start with current issue, and are sent via surface mail. Optional foreign airmail rates (add to subscription price): Canada — $7, Mexico & Central America — $6, South America — $9, Europe — $9, all others — $12.

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Total Enclosed

Please make checks payable to:
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TILL
JAN. 31, 1978

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Contents of Past Issues *(Issues not listed are Out of Print)*

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Summer
1974

Setting Food By *Doris Herrick*
Ehrlich's Guide to the Apocalypse: Food *Anne H. Ehrlich and Paul R. Ehrlich*
Tongue Fu *Paul Krassner*
Sanctity and Adaptation *Roy A. Rappaport*
Natural History Comes to Whole Earth *Peter Warshall*
Land Banking *Huey Johnson*
Gravity Engines and the Diving Engine *Steve Baer*
Sexual Honesty *Shere Hite*
New Games Tournament *Pat Farrington*
Salons and Their Keepers *Stephanie Mills*
Notes on Provisioning a Small Boat for Extended Cruising *Kathleen Pumphrey*
Apple Picking *Rick Fields*
Bookmaking Access *Robin Rycraft*
Making and Playing the Shakuhachi *Monty H. Levenson*
Gorf *Michael McClure*
The POINT/Penguin Books Publisher-Distributor Contract for the Whole Earth Epilog *Lawrence Klein*

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1976

Olbers' Paradox *Lawrence Ferlinghetti*
Jacques Cousteau at NASA Headquarters
Free Lunch Comix and Stories *Dan O'Neill*
On Observing Natural Systems *Francisco Varela in conversation with Donna Johnson*
Carl Ortwin Sauer 1889-1975 *James J. Parsons*
Theme of Plant and Animal Destruction in Economic History *Carl Sauer*
A Carl Sauer Checklist *Robert Callahan*
Trees *Jean Giono*
The Hoedads *J.D. Smith*
Environmental Impact Reports *Peter Warshall*
The B & G, The Bomb *Steve Baer*
Three Political Ideas *Paul Maag*
Theory of Game-Change *Stewart Brand*
Some Mice *Robert Horvitz*
Get Down Tonight *Deborah Haynes*
Sex Notes *Kay Weiss*
The Space Crone *Ursula Le Guin*
Memory One: Getting Started in Orygun *David Shetzline*
Winning *Ron Jones*
The Education of Joni Mitchell
Its our very effort to make reality repeatable which Buddhism calls suffering *Zentatsu Baker-Roshi*

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1976

From Present to Future *Herman Kahn with William Brown and Leon Martel*
The Shift from a Market Economy to a Household Economy *Scott Burns*
Future Primitive *Raymond Dasmann*
Biogeographical Provinces *Raymond Dasmann*
Controversy Is Rife on Mars *interviewing Carl Sagan and Lynn Margulis*
Odd Bodkins *Dan O'Neill*
Boone *Gurney Norman*
Mind/Body Dualism Conference Position Papers
  Invitational Paper *Gregory Bateson*
  Inside & Outside *Richard Baker-roshi*
  Position Paper *Ramon Margalef*
  Not One, Not Two *Francisco Varela*
Community Gardening *Rosemary Menninger*
The Foredads *Gary Rurkun*
Effects of Sublethal Exposure to 2,4,5-Trichlorophenoxy-Acetic Acid *J.R. Felix and Pierre Mortmain Sylvestre*
Underground Architecture *Malcolm Wells*
Cross-Generation Marriage *Theodora Kroeber-Quinn*
Earthshoes & Other Remarks *Ken Kesey*
May 12 *Louise Nussbaum*
A Street Man's Answer to Rape: Humiliate the Raper *Willie "Small Banana" Williams*
Animal Stories *J.D. Smith*
The American Anti-Whaling Movement Is Racist *Michael Phillips*
Lucy's Blueprints *Lucy Burrows Morley and Christopher Thompson*

12
Winter
1976

Streaming Wisdom *Peter Warshall*
Watershed Form and Process: The Elegant Balance *Robert R. Curry*
John Wesley Powell: Conscience of the Colorado *Peter Wild*
Watershed Vignettes *Thomas Dunne and Luna B. Leopold*
Another Watershed Vignette: Lake Tahoe, California *Peter Warshall and J.T. and Carin Winneberger*
Diagnosing Stream Health *Thomas Dunne and Luna B. Leopold*
El Rancho Los Pesares *Jaime de Angulo*
Forests and the Purposes of Man *Roy A. Rappaport*
Headwaters: A Short History of a Backwoods Battle *Randal Lee O'Toole*
Whose Trees? Whose Science? *Jack Westoby*
Christo's Running Fence *Mike Alexander, Barbara and Paul Kayfetz, Peter Warshall*
Healing the Land: The Redwood Creek Renewal Project *Gerald Myers*
That Which Makes You Move: A Conversation With Taj Mahal *Lewis MacAdams*
Interspecies Music *Jim Nollman*
Access to Watershed Music *Peter Warshall*
From Urgencies to Essentials *speech by Canadian Prime Minister Pierre Elliott Trudeau*
The New Alchemists *J. Baldwin*
The Acorn People *Ron Jones*
I would like to write a silence *Anne Herbert*
Odd Bodkins *Dan O'Neill*

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Summer
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Voluntary Simplicity (3) *Duane Elgin and Arnold Mitchell*
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Remarks on Recombinant DNA *James Watson*
There Ain't No Graceful Way *Astronaut Russell Schweickart talking to Peter Warshall*
Mushroom Hunting in Oregon *Andrew Weil*
Time Landscape *Alan Sonfist*
The Transformation of the Tract Home *Richard Nilsen*
Burning Wood *J. Baldwin*
The Ultimate City — Part 1 *J.G. Ballard*
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The Price of Marijuana Misinformation *Russell Falck*
Death Does Not Exist *Dr. Elisabeth Kubler-Ross*
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The Death of Ivan Ilych *Leo Tolstoy*
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Who Cut Down the Sacred Tree? *Michael W. Foley*
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Odd Bodkins *Dan O'Neill*
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Wilderness Plots *Scott Sanders*
Two Dangling Animal Stories and a Heavy Bear Story *J. D. Smith*
The Custer Wolf *Patrick Holland*
Broken Circuits, Smoke and Fire *Judy Melvoin*
If the Spirits of the Dead Do Walk Among Us, Where Do They Spend Their Summer Vacations? *Robert Goldman*
Giraffe's Neck *Terry Lawhead*

"Television is a triumph of equipment over people, and the minds that control it are so small that you could put them in a gnat's navel with room left over for two carraway seeds and an agent's heart."

–Fred Allen

"Now that's what television gives you – a huge wanting and nothing to show for it but more of the same."

–Norman Mailer

"TV must become our council fire, our town hall."

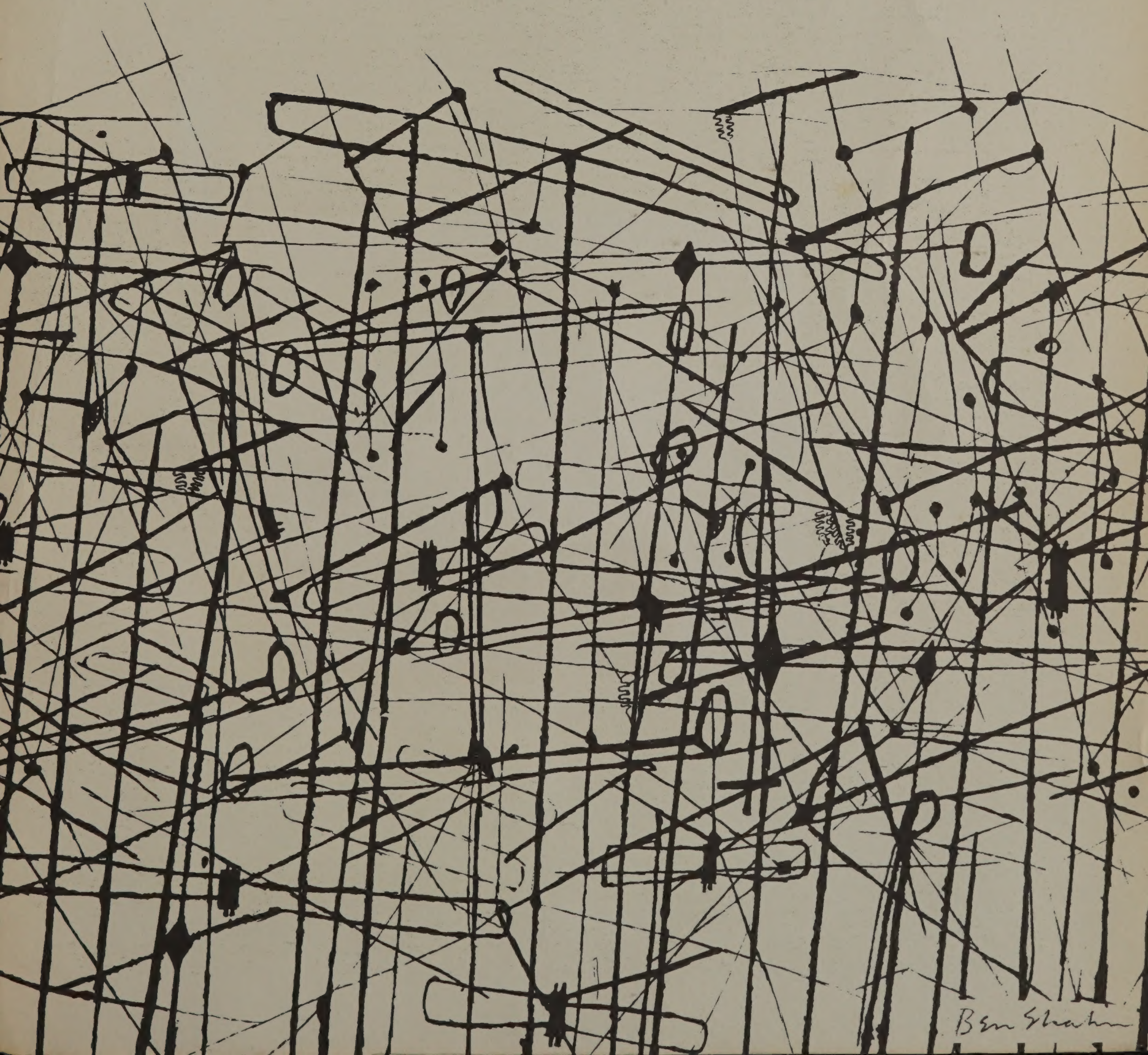
– Pete Seeger

"The advantages of a new medium will become such as to lead to the emergence of a new civilization."

–Harold A. Innis

"The poet was alone in the midst of an industrial world. Now he is alone in the midst of a poetic world. Thanks to this world, as generously equipped for escapism as it is for winter sports, by the theaters, the cinematograph, the glossy magazines, the poet at last regains his invisibility."

–Jean Cocteau



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